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THE DENTAL REVIEW

A MONTHLY JOURNAL
DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE

C. N. JOHNSON, M. A., L. D. S., D. D. S.
EDITOR

ANNUAL INDEX
VOL. XXXI
1917

PUBLISHED BY
H. D. JUSTI & SON
810 MASONIC TEMPLE
CHICAGO, ILL.
U. S. A.

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Barber, E. S., Chicago, Ill.
Barrows, Professor H. T., Chicago, Ill.
Best, Elmer S., Minneapolis, Minn.
Bloodgood, Joseph Colt, Baltimore, Md.
Bowers, F. H., Freeport, Ill.
Brophy, Truman W., Chicago, Ill.
Buckley, J. P., Chicago, Ill.
Carmichael, J. P., Milwaukee, Ill.
Carpenter, Elliott R., Chicago, Ill.
Chayes, Herman E. S., New York, N. Y.
Coltrin, C. W., Chicago, Ill.
Committee on Law (State Society), Quincy, Ill.
Coolidge, Edgar D., Chicago, Ill.
Culhane, A. B., Rockford, Ill.
Daniels, R. H., Peoria, Ill.
Davis, L. L., Chicago, Ill.
Dittmar, G. Walter, Chicago, Ill.
Friesell, H. E., Pittsburgh, Pa.
Gallie, Donald M., Chicago, Ill.
Gardner, Joseph A., Memphis, Tenn.
Gethro, F. W., Chicago Ill.
Gilmer, Thos. L., Chicago, Ill.
Hammer, Oscar, St. Louis, Mo.
Holroyd, W. J., Pittsburgh, Pa.
Hoover, J. L., Shelbyville, Ill.
Hurdy, Wm. F., St. Louis, Mo.
Johnson, C. N., Chicago, Ill.
Kershaw, Bert H., Chicago, Ill.
Kestner, Bert H., Chicago, Ill.
Kirby, John L., Chicago, Ill.
Knowles, Sydney J., Chicago, Ill.
Leach, Floyd D., Chicago, Ill.
Lewis, H. S., Chicago, Ill.
Lewis, R. I., Chicago, Ill.
Lydston, Frank, Chicago, Ill.
Mathison, W. E., Chicago, Ill.
McGauley, Walter G., Boston, Mass.
Meyer, L. A., Oconomowoc, Wis.
Molt, Frederick F., Chicago, Ill.
Mueller, A. H., Chicago, Ill.
Noyes, Edmund, Chicago, Ill.
O'Hard, F. S., Springfield, Ill.
Owen, Elbert-Britten, St. Louis, Mo.
Piperno, Arrigo, Rome, Italy.
Potter, Hollis E., Chicago, Ill.
Potts, Hubert A., Chicago, Ill.
Price, Weston R., Cleveland, Ohio.
Reeves, W. T., Chicago, Ill.
Schewe, E. F., St. Louis, Mo.
Schmuck, E. A., Chicago, Ill.
Schneider, Adolph E., Chicago, Ill.
Schuhmann, H. H., Chicago, Ill.
Schultz, L., Chicago, Ill.
Thomas, Grill H., Chicago, Ill.
Thomas, Newton G., Chicago, Ill.
Whippel, Henry L., Quincy, Ill.
Whitmore, Y. E., Little Rock, Ark.

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Almon, Homer, Chicago.
Barker, S. G., Jefferson, Ia.
Berthold, A., Chicago.
Brown, L. R., Clearfield, Pa.
Best, Elmer S., Minneapolis, Minn., 1015.
Cormany, James W., Mount Carroll, Ill.
Cross, H. A., Chicago.
De F. Davis, O., Minneapolis, Minn.
Fellman, W. O., Oak Park, Ill.
Fugua, Victor H., Chicago, Ill.
H. J. M., Chicago, Ill.
Hart, Chas. S., Evanston, Ill., 649.
Johnson, C. N., Chicago, Ill.
Kolter, J. H., Wausau, Wis.
Lawrence, W. F., Carpenteria, Calif.
Landrum, J. W., Heavener, Okla.
Lewis, D. N., Lake Forest, Ill.
Light, R. E., Chicago, Ill.
Levenhagen, F. G., Wausau, Wis.
Lee, R. W., Chicago, Ill.
Maginnis, Eugene, Chicago, Ill.
Munroe, Gropher, Springfield.
Miller, Frank L., London Mills, Ill.
Nelson, J. F., Chicago, Ill.
Neushwander, E. L., Morris, Ill.
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Perry, E. J., Worthington, Iowa.
Puterbaugh, P. G., Chicago, Ill.
Roubert, L. N., Chicago, Ill.
Smeltzer, N. R., Chicago, Ill.
Schluffarth, H. F., Chicago, Ill.
Staley, H. Reid, Harvey, Ill.
Shallinbeyer, W. C., Chicago, Ill.
Salesbury, A. G., Takaka, N. Z.
Stephan, F. W., Chicago, Ill.
Smith, Arthur G., Peoria, Ill.
Sher, William V., Chicago, Ill.
Sitherwood, Geo. W., Bloomington, Ill.
Schmuck, E. A., Chicago, Ill.
Thorpe, Lee Burton, St. Louis, Mo.
Turnquist, H. E., Minneapolis, Minn.
F. A. W., Chicago, Ill.
Waltz, J. F. F., Decatur, Ill.
Whitmore, Y. E., Little Rock, Ark.

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THE COMPLETE TECHNIC INVOLVED IN THE THREE CLASSES OF PULP CANAL OPERATIONS.*

BY ELMER S. BEST, D. D. S., MINNEAPOLIS, MINN.

While your essayist will endeavor to direct your attention and interest to the great problem of pulp canal operations let no one take this to imply that he is an advocate of the creating of pulpless teeth by the removal of vital pulps, so called "devitalization of teeth." A pulpless tooth can never be made quite as good as one with a sound healthy pulp and in addition to this let us understand distinctly that in such operations we assume a responsibility that is not to be lightly considered. Why then do we remove the tooth pulp? In a question between the loss of a pulp and the loss of a tooth it seems to me that if we are prepared to, we should remove the pulp and save the tooth. I say, "save the tooth" because I believe that in spite of the thousands of cases showing the most damaging evidence to the contrary that we are going to emerge from our present predicament with an operation that will give us a pulpless tooth that can be carried through adult life without being the seat of infection. Our greatest problem today is with the tooth which has been pulpless for some time. We all know that there will be fewer pulpless teeth in the future than in the past, for a large percentage of such teeth were rendered pulpless because the presence of the pulp caused discomfort to the patient when the dentist undertook certain restorations on the crown of the tooth. At present, conditions are different and we have several means of robbing such operations of their pain. Some of these are very beneficial, but in one of them there is also a grave element of danger. One of these methods, viz., general anesthesia such as nitrous oxid, etc., appears particularly dangerous and we will discuss it briefly. One of the causes of pulpal hyperemia is the overheating of the tooth. Many times an otherwise extremely painful operation of cavity preparation is made quite bearable by the application of a stream of water or a fine jet of cold air as suggested by Dr. Reeves, thereby keeping the tooth at a safe temperature. Generally speaking, in the use of general anesthetics it is not possible

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*Read before the Wisconsin State Dental Society, July 1916.

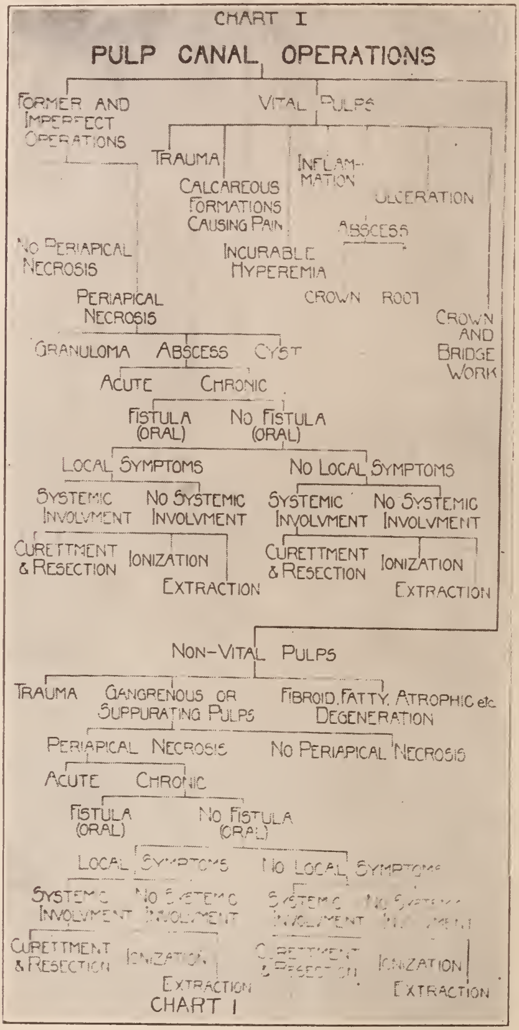
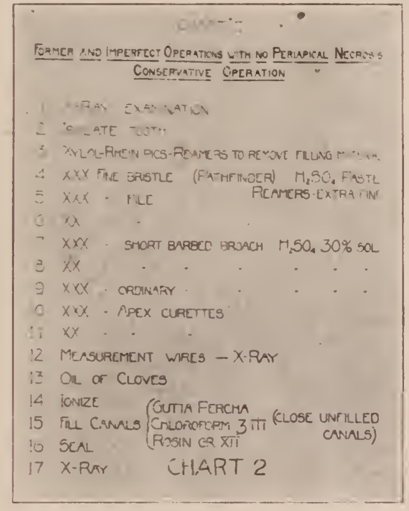


CHART I.

Shows the condition found in the three different classes of pulp canal operations.

to observe any of these precautions, except possibly in the hands of a few expert operators. The chief idea seems to be to work as rapidly as possible and prepare if necessary a great many cavities while the patient is under the influence of the anesthetic. I have come rather frequently in contact with three conditions due to the use of this agent. Too extensive cutting has caused an exposure of the pulp. Too rapid cutting also causes an overheating of the tooth or sometimes several teeth, thus hypermia is set up. Lastly a rather amusing condition. Owing to the inability of the patient to feel pain and to the hurry in which the cavities were prepared, I have observed crowns and inlays placed on non-vital teeth with large infected periapical areas in the assumption that they were vital teeth.



FORMER AND IMPERFECT OPERATIONS WITH NO PERIAPICAL NECROSIS
CONSERVATIVE OPERATION

1 X-RAY EXAMINATION
2 ISOLATE TOOTH
3 XYLOL-RHEIN PICS-REAMERS TO REMOVE FILLING MATERIAL
4 XXX FINE BRISTLE (PATHFINDER) H_2SO_4 FASTE
5 XXX - FILE REAMERS-EXTRA FINE
6 XX -
7 XXX - SHORT BARBED BROACH H_2SO_4 30% SOL
8 XX . . . . . .
9 XXX - ORDINARY . . . . .
10 XXX - APEX CURETTES
11 XX - - -
12 MEASUREMENT WIRES — X-RAY
13 OIL OF CLOVES
14 IONIZE
15 FILL CANALS {GUTTA PERCHA
CHLOROFORM ℥ iii
ROSIN GR XII} (CLOSE UNFILLED CANALS)
16 SEAL
17 X-RAY

CHART 2

CHART II.

Shows the various steps involved in a conservative operation. That is when our duty is complete when we have cleaned and filled the canals.

I will not attempt tonight to dwell on the effect which infected teeth have on the patient's system. This fact has been satisfactorily established and is, I find, generally accepted. I shall, however, try to show you what I consider to be the principal causes leading to such conditions of the teeth, and also what I consider a rational method of preventing such conditions. To your essayist one of the principal causes of our recent predicament is the fact that although our degree assures us of the fact that we are Doctors of Dental Surgery (notice the Surgery, please), yet we seem to have had no more conception of the real significance of asepsis than if the word was the name of a recently launched U. S. battleship. Possibly you consider this statement too strong, so I will modify it and say that we are the real offenders who have been guilty of the following habits: First, not using the rubber dam. Second, wrapping unsterilized cotton from open cotton holders on smooth broaches, and placing them in the pulp canals. Third, sealing canals with cotton or porous cements. I do not think it is necessary to go further.

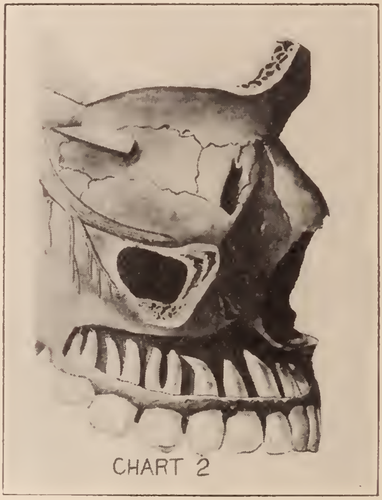


CHART II. B.

Shows the indications for a radical operation. A diseased area is seen over the cuspid, the removal of which would be a necessary sequel to a pulp canal operation. Also under class one and three, less frequently in class two, it would be advisable to remove the apical portion of the second bicuspid which we might be unable to open and clean and fill.

I want to go on record as saying that the habit of opening into the vital dental pulp without a working knowledge of aseptic precautions and strict application of the same, is a crime against humanity and the tragic part of it is that the innocent suffer.

The profession may be broadly divided into two classes—those who practice dentistry merely for the sake of the money in it, and secondly those who in addition to the pecuniary rewards are really trying to improve dentistry as well as themselves.

To the first class belongs the advertising dentist. It is useless to try to interest such a man in the advancement of the profession—and the hope of the dentist is in the last named class.

Another interesting observation is that some men do poorer operations after they leave college than they did before, for the same reason that many men in this world are so constructed that they only do their best under the surveillance or guidance of those whose duty it is to see that their work measures up to a certain standard. Left to themselves, however, their work is always below standard. How many of us belong to this class? Let me answer it with another question. How many of us whenever one of our operations, be it inlay, crown, bridge or plate, is unexpectedly to be viewed by one of our confreres, hasten to assure him that there is something wrong but for such and such a reason we were not able to do a good operation?

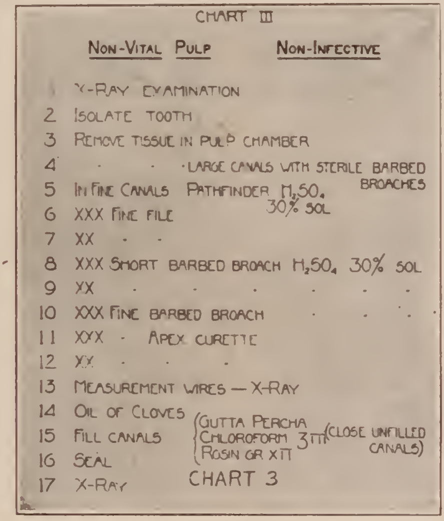


CHART III

NON-VITAL PULP NON-INFECTIVE

1 X-RAY EXAMINATION
2 ISOLATE TOOTH
3 REMOVE TISSUE IN PULP CHAMBER
4 · · · LARGE CANALS WITH STERILE BARBED BROACHES
5 IN FINE CANALS PATHFINDER H_2SO_4 30% SOL
6 XXX FINE FILE
7 XX · ·
8 XXX SHORT BARBED BROACH H_2SO_4 30% SOL
9 XX · · · · · ·
10 XXX FINE BARBED BROACH · · · ·
11 XXX · APEX CURETTE
12 XX · · ·
13 MEASUREMENT WIRES — X-RAY
14 OIL OF CLOVES
15 FILL CANALS (GUTTA PERCHA / CHLOROFORM ʒii / ROSIN GR XII) (CLOSE UNFILLED CANALS)
16 SEAL
17 X-RAY

CHART 3

CHART III.

In this operation we are not dealing with an infectious pulp. Hence do not have the danger of carrying any of this material through the foramina.

How much more liable are we to see the hidden operations slighted. You all noted what Hunter said, and more recently what Schamberg said about good bridgework being so rare that it is a luxury for a wealthy patient to possess it. Ottolengui realized the situation when he took the "Green Bus" among the Philistines and said "your state board license permits you to practice dentistry, it does not compel you to." Rhein knew it when he said, in speaking of pulp canal operations, "Gentlemen, you have dragged this operation in the gutter for so many years that you are ashamed of it, you despise it," and Raper was looking into the near future when he said "the time is rapidly coming when the layman will seek as his dentist the man who will look after his health, and not the one who wants to decorate him." And all the time Callahan, Prinz, Ottolengui, Rhein, Buckley, Hartzell, Kells, and others have been anxious and willing to show us the way to success. These men have all sacrificed themselves to help dentistry, but we must need wait until Mayo, Billings, Rosenow and others of our medical confreres caution us as to our position. Ulrich with his strict hemotogenous theory has given us a jolt, and when he demands a good showing of well filled canals with no periapical necrosis, there seemed to be so few in existence as to be almost a rarity. A personal examination of 3,000 cases shows less than 10 per cent of the

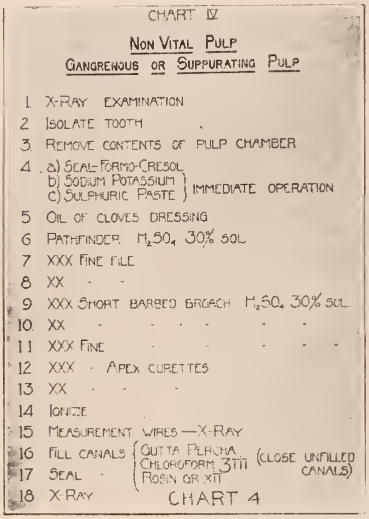


CHART IV

NON VITAL PULP

GANGRENOUS OR SUPPURATING PULP

1. X-RAY EXAMINATION
2 ISOLATE TOOTH
3. REMOVE CONTENTS OF PULP CHAMBER
4. a) SEAL-FORMO-CRESOL
b) SODIUM POTASSIUM } IMMEDIATE OPERATION
c) SULPHURIC PASTE }
5 OIL OF CLOVES DRESSING
6 PATHFINDER H_2SO_4 30% SOL
7 XXX FINE FILE
8 XX - -
9 XXX SHORT BARBED BROACH H_2SO_4 30% SOL.
10. XX - - - - - -
11 XXX FINE - - - - -
12 XXX · APEX CURETTES
13 XX - - -
14 IONIZE
15 MEASUREMENT WIRES —X-RAY
16 FILL CANALS { GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII } (CLOSE UNFILLED CANALS)
17 SEAL -
18 X-RAY

CHART 4

CHART IV.

We must be very careful not to carry any of the infectious contents of the pulp chamber and pulp canals through the foramina.

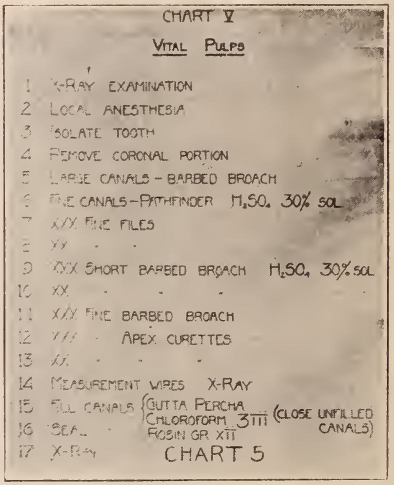


CHART V

VITAL PULPS

1 X-RAY EXAMINATION
2 LOCAL ANESTHESIA
3 ISOLATE TOOTH
4 REMOVE CORONAL PORTION
5 LARGE CANALS - BARBED BROACH
6 FINE CANALS - PATHFINDER H_2SO_4 30% SOL
7 XXX FINE FILES
8 XX - -
9 XXX SHORT BARBED BROACH H_2SO_4 30% SOL
10 XX - - -
11 XXX FINE BARBED BROACH
12 XXX - APEX CURETTES
13 XX - - -
14 MEASUREMENT WIRES X-RAY
15 FILL CANALS { GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII } (CLOSE UNFILLED CANALS)
16 SEAL -
17 X-RAY

CHART 5

CHART V.

In removing pulp if a diseased condition appears around the apex of this root we must hold ourselves responsible. In this class of cases arsenic and powerful tissue destroying drugs in pulp canals are contraindicated.

pulpless teeth with the canals filled and over 70 per cent of the unfilled showing periapical necrosis.

It might appear from the above that you have selected as your essayist a pessimist of the deepest dye, but, gentlemen, this is not so. If I did not believe that these conditions could be and would be, yes, are already being changed I would not be with you today, nor would I continue the practice of my profession. We can do good pulp surgery, the great question is how many will "hit the trail."

What I shall try to give you tonight is the result of over three years' constant study on this subject. But I want to caution you that the methods which I may advocate are so rapidly being changed and improved upon, that by tomorrow some of them may be obsolete.

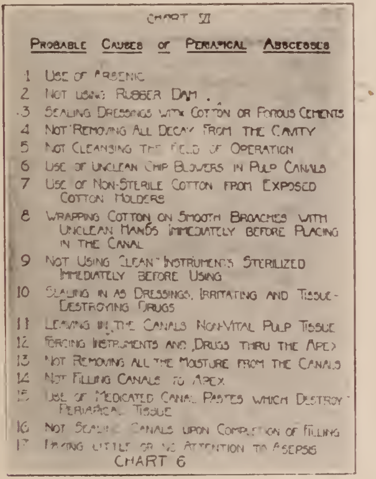


CHART VI

PROBABLE CAUSES OF PERIAPICAL ABSCESSES

1 Use of Arsenic
2 Not using Rubber Dam.
3 Sealing Dressings with Cotton or Porous Cements
4 Not Removing All Decay from the Cavity
5 Not Cleansing the Field of Operation
6 Use of Unclean Chip Blowers in Pulp Canals
7 Use of Non-Sterile Cotton from Exposed Cotton Holders
8 Wrapping Cotton on Smooth Broaches with Unclean Hands Immediately before Placing in the Canal
9 Not Using Clean Instruments Sterilized Immediately before Using
10 Sealing in as Dressings, Irritating and Tissue-Destroying Drugs
11 Leaving in the Canals Non-Vital Pulp Tissue
12 Forcing Instruments and Drugs thru the Apex
13 Not Removing all the Moisture from the Canals
14 Not Filling Canals to Apex
15 Use of Medicated Canal Pastes which Destroy Periapical Tissue
16 Not Sealing Canals upon Completion of Filling
17 Having Little or No Attention to Asepsis

CHART 6

CHART VI.

In case we have been guilty of any of these conditions we have contributed our share to the great number of infected pulpless teeth. Arsenic is dangerous and unnecessary. Periapical tissues are frequently destroyed by powerful drugs sealed in canals, and these areas may become the seat of an infection of secondary origin, hemotogenous origin.

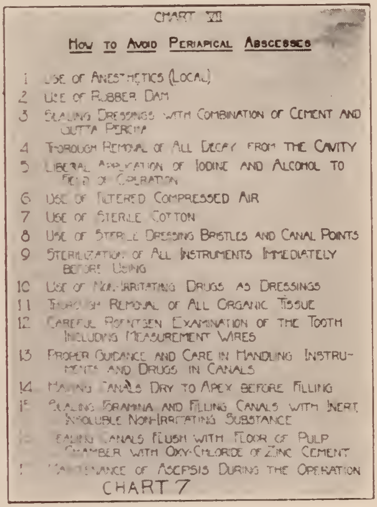


CHART VII

HOW TO AVOID PERIAPICAL ABSCESSES

1 Use of Anesthetics (Local)
2 Use of Rubber Dam
3 Sealing Dressings with Combination of Cement and Gutta Percha
4 Thorough Removal of All Decay from the Cavity
5 Liberal Application of Iodine and Alcohol to Field of Operation
6 Use of Filtered Compressed Air
7 Use of Sterile Cotton
8 Use of Sterile Dressing Bristles and Canal Points
9 Sterilization of All Instruments Immediately before Using
10 Use of Non-Irritating Drugs as Dressings
11 Thorough Removal of All Organic Tissue
12 Careful Roentgen Examination of the Tooth Including Measurement Wires
13 Proper Guidance and Care in Handling Instruments and Drugs in Canals
14 Having Canals Dry to Apex before Filling
15 Sealing Foramina and Filling Canals with Inert Insoluble Non-Irritating Substance
16 Sealing Canals Flush with Floor of Pulp Chamber with Oxy-Chloride of Zinc Cement
17 Maintenance of Asepsis During the Operation

CHART 7

CHART VII.

Contains some practical hints which will assist us in having more satisfactory results with our operations. In dental surgery where we come in contact with the patient's system the same principles apply as in general surgery.

We have three great classes of pulp canal operations:

First. Those on teeth which contain former and imperfect canal operations, Second. Those on teeth containing vital pulps.

Third. Those on teeth containing non-vital pulps.

In doing operations on teeth in classes as one and three and occasionally on multi-rooted teeth, in class two, we have found it the best practice to consider the indications for conservative and for radical operations.

By conservative operations we assume that our duty is performed when we have, under aseptic conditions, removed the organic tissue, cleansed the canals, sealed the foramina, and filled the canals.

By radical operations we mean the complete filling of the canal, and in addition the removal of necrotic periapical tissue and sometimes root resection, because of the death of the peridental membrane around the root tip. Resection is also indicated on some occasions because of our inability to remove the organic tissue from and fill the apical portion of very crooked roots.

MODERN IDEAS ON MODERN PHASES OF DENTAL PRACTICE.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO, ILL.

In the consideration of some of the phases of modern practice of dentistry it seems to me that the newest ideas concerning oral infection with reference to bodily harm are the theories which have stepped most prominently into the limelight of observation. The very diversified opinions on subjects related to this phase of modern medicine and dentistry are based on thoroughly scientific principles, but to my mind many times deductions are drawn, which are subject to much criticism, from a scientific standpoint, and it would appear as well from a practical one. One thing however is certain—oral infections must be recognized and their influence carefully weighed in each case.

The theories involved in infections and immunity are so well known and have been dwelt upon by myself and many others in numberless writings, that I do not feel that it is necessary to burden you today with these rather complicated fundamentals. My object will be to make this talk rather short and practical, but I shall interject sufficient ammunition to be assured of a lengthy and wholesome discussion. I feel that nothing in learning is as beneficial as impersonal, friendly discussion. It is by such means that points of interest and at issue are brought out and many times cleared up so that all sides can obtain a clearer view of the matter under consideration.

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*Read before the Northwestern District of the Iowa State Dental Society, Nov. 9, 1916.

It would also be of very little use to go into the history of oral infection, as I have no doubt you are quite familiar with the numerous prominent articles which have been written on the subject; beginning with Hunter's tirade against the dental profession, and the thoroughly unscientific manner in which a good deal of dental work was being carried out at that time, down to the more recent articles by scientific men of modern days on infections; including the valuable writings on subjects relating to immunity and specificity of germs. There is no gainsaying that a great deal of good has been accomplished by the tremendous interest which has been taken by the medical and dental profession, as well as by the laity, on the subject of the influence of oral infections on bodily health.

It certainly has awakened the dental profession to do more accurate and better mechanical work and has caused them to look more closely to proper therapeutics, but, best of all, it has brought many of us to the realization of our want of medical knowledge generally.

No one today will question that oral infections have much to do with bodily disease, but to my mind, there is also no question that this interrelationship of oral infections to general health has been greatly exaggerated, and the methods to overcome it frequently unscientifically carried out.

Our present mode of diagnosis of various oral disease manifestations have been inadequate and faulty, and surely leave much to be desired. Unfortunately, at the time most of us receive our college education it was not deemed a requisite for dental practitioners to know much of medicine generally, and still less of the diagnostic value or the meaning of cultures, or smears, urinalysis, blood analysis, or pathology in general. Today when we are confronted with the realization that we are working on living tissues, and that a great interdependency exists between oral and general conditions and that the abnormal findings obtained in these various analyses mean definite things, we must realize the undisputable fact that we, as dentists, must have more medical education in order to be able to cope properly with these conditions, and to be able to understand various medical findings intelligently.

Having been a student of fundamental medical science for some years, it is hardly necessary for me to assure you that I am a thorough believer in the interrelationship of oral foci of infection with expressions of general pathological conditions situated elsewhere, and I wish to emphasize this fact in order that I may not be misunderstood, in case my drawing your attention to the overdoing of the theories involved might lead you to suspect that I was not a believer in these ideas. Quite the contrary; I am a very staunch supporter of them. Oral foci of infection must be removed but before this our diagnoses must be correct.

I feel that the pendulum of *radical* practice associated with the removal of oral foci of infection has swung much too far in one direction, and it is mainly for the purpose of drawing your attention to *that* fact that I am addressing you this evening. I feel that it is high time a halt be called on the terrible propaganda of ruthless extractions, that has gone very much too far, and has done our patients and our own professional standing a great deal of harm. I fear that many members of our worthy profession have forgotten that they are or should be scientific men, men who should be able to draw scientific deductions—be able to prove them and insist upon such *proper* therapeutic measures as they know to be indicated.

The mere production of an X-ray film signed by a photographer "blind abscess" should by no means mean an inevitable death warrant to a tooth,—I mean its extraction.

That physicians have been correct in their belief that oral foci of infection were the fundamental cause of many cases brought to their attention, I have no doubt is correct, but I am afraid that frequently either their inability to diagnose to a certainty or the impossibility of definite diagnosis has led some of them to lay more stress on oral infectious conditions than the cases in question really warranted. I am not basing these ideas on theories altogether for I have had them substantiated by actual experience.

Somehow through my efforts in studying and writing along these lines I have been drawn into rather a closer relationship with the medical profession in the past two years than I had been accustomed to previous to that time, and it may be of interest to you, for me to state here, that I have seen with physicians a great many interesting cases, particularly of arthritis and endocarditis. I must admit, however, that the ultimate results in diagnosis and cure in these instances have been very much mixed. I believe that the proportion of cases benefited by the removal of what we call oral foci of infection to those who were not helped by whatever therapeutic measures were instituted by the dentist for that purpose, rather causes me to lean toward the conclusion that only the minority of cases were actually benefited by dental interference, including extractions. That does not necessarily mean that oral foci of infection were not the primary cause of the trouble, for it is quite possible that a blind abscess or an alveolitis pocket may have spread its infectious material to such an extent to other localities, that even the removal of the primary cause of the infection had failed to eradicate the transplanted secondary invasion, which had been carried elsewhere, and therefore from a practical standpoint, our dental interference had not removed the *actual present* cause of the condition. You will realize that it is quite reasonable to suspect that infections once carried to other localities and tissues and there thoroughly located for some time would hardly be expected to subside, even if the primary seat of infection were eradicated, because of the fact that at such a time the secondary infection would be well seated and established in its new locality. I admit that there were *some* cases in which surprisingly beneficial results attended proper dental treatment, and it is noteworthy that *those* usually pertain to cases of more *recent* secondary infection, and were more frequently found in connection with alveolitis and its infections than with blind abscesses. That is probably readily explained by the fact that the one may be a much more acute state of infection than the other, the question of opsonic index and antibody production may also have much to do with it. I might bore you with many useless statistics, but from the general findings, it would seem that the ideas pertaining to the interrelationship of blind abscess to general infections are at the present time not at all definitely settled, no more in the minds of physicians than in the belief of dentists, and for that reason it seems to me all the more, why we as dentists should assert ourselves and use our scientifically trained minds along *with* those of the physician and not dogmatically follow the instructions of the medical men as to dental therapeutic measures, which far too often mean useless extractions. These gentlemen may be thoroughly interested in their cases, and usually they are, but they are not and can hardly be expected to be able to interpret the meaning of dental X-ray photographs, nor symptomatic findings in relation to oral organs any more than a dental opinion on an X-ray of a diseased kidney or ovary would be considered of great importance. Physicians are apt to look upon the value of the teeth in a negligible manner, and as only a few years ago the appendix was ruthlessly removed, followed later by a period of ruthless tonsillectomies, it has now become their idea in many instances to order extraction of the teeth in quite a perfunctory manner.

I regret to state that there are men in our profession who have fallen so far away from the truly scientific road that in order to cater to physicians they have practically become extractionists and plate makers in blindly following out the wishes of their medical confreres. There are two reasons to my mind why the independence of dentists has fallen to such a lamentably low state. One is the development of commercial ideas in the minds of some of these gentlemen and the other I should say, at least charitably, is probably the more important one, and is the lack of scientific knowledge and their realization of such deficiency. When you consider the utter lack of fundamental medical education possessed by many dentists it is small wonder that in meeting with physicians they are apt to be looked upon as little more than mechanics, and for that reason are ordered about as such. Our greatest need at the present time, I feel, is for more education along medical lines. It may be difficult for men who are busy and have left the matter of study to the younger generation for some time, to return to the arduous work of studying and reading, but gentlemen, let me assure you that *some* in the dental profession (and I am happy to note their growing number) are advancing along the lines of scientific medicine and scientific dentistry at such a pace, that it will only be a short time before our ranks will be found divided into mere mechanics and men of scientific education and ability.

To gain the respect, the admiration, the good will and co-operation of physicians the prime need for those coming into consultation with these men will be ability. When you can approach these physicians with questions and arguments based on microscopic findings, or the results of blood and urine analysis, and can carry such arguments on with a feeling of assurance of thorough familiarity with the ground upon which you are treading, you will be pleased at the courteous manner in which these gentlemen will look up to you and meet with you. Nothing appeals so strongly to a scientifically trained mind as the ability to discuss matters pertaining to science with one who is equally or better trained in his field of work. I cannot too strongly recommend to dentists in general that they immediately take up, in all seriousness the study of the fundamentals in diagnosis; namely, the study of histology, pathology, urinalysis, blood analysis and bacteriological laboratory work. Only a dentist who has at his command a thorough knowledge of the meanings and findings in such matters is really able or is really in a position to be used as a consultant of any value in the diagnosis or cure of such cases, where the interrelationship of oral conditions to systemic troubles is brought into consideration.

The ability to read X-ray photographs properly and in a scientific manner is another thing which we dentists must immediately undertake to perfect ourselves in. At the present time I am afraid that many of us are prone to render snapshot judgments the moment a picture is shown with ever so slightly darkened an area about the roots of a given tooth. It has been the custom of many X-ray laboratory men to write their own diagnosis under these pictures, and a good many of them have been termed "blind abscesses," when the question of the presence of an abscess has by no means been established by the appearance of the picture. It is still quite an unsettled question what those darkened areas about the roots of pulpless teeth on X-ray films really mean. Certainly no one has ever demonstrated in a scientific manner when they should be termed "granulomas" or "blind abscesses" or "rarefied areas." I have myself seen a great many pictures where a very slight shadow on the photograph has been finally demonstrated through the extraction of the tooth to be a large blind abscess, and I have also seen similar pictures where although a considerable darkened area was to be seen about the root end of a tooth when upon extraction the root surface exhibited no visible pathological disturbances whatever,—no absorption and no remnants of a pus sac, and I believe that in many instances these darkened areas (unless they are so plain as to leave no doubt of an abscess) may mean a good many things, among them the possibility and probability of merely a condition of coagulated albuminous matter in the intercellular substances due to the use of various drugs used in the devitalization of the pulp and in treatment of the root canal. A good deal of care, therefore, in the interpretation of X-ray pictures should be used,—particularly if the photograph is taken for the purpose of aiding in the diagnosis of other bodily disturbances. The relation of the blood picture, urinanalysis and microscopical findings to other infections generally is most important, and should be some of the additional methods of interpreting the meaning of possible oral infections.

In order to arrive at such a state, where we can really serve humanity as scientific men should it will therefore be necessary for us to become conversant with the scientific principles involved in medicine generally and then to insist upon our equal rights as scientific men to utilize that knowledge in discussing matters pertaining to our cases in a scientific manner with physicians, and to render our honest and truly scientific deductions so that we may be of real value and benefit to our patients and a credit to our profession.

As I briefly suggested above, the proper reading and interpretation of X-ray photographs is a subject which as yet is by no means of entirely clear understanding. Many of these interpretations of visible disturbances, or rather irregularities, which we have been accustomed to term disturbances, have by habit become adopted as such but without any scientific reason whatever. Only very recently I became much interested in a statement which was based on similar reasoning by one of my Chicago confreres who, in an article published in the Dental Review referred to the prevalence of poor root canal work and stated that only twenty per cent of root canal fillings were made in such a manner as to preclude infections, and he further stated that the examination of 400 X-ray pictures investigated by himself showed that these infectious conditions exist in that proportion. How does he know? What were his methods in obtaining such statistics? Of what really scientific value are statistics obtained by such means? He simply condemned as infected every root which upon X-ray examination showed a slight shadow about the apex. He then goes on further and states that only five per cent of those 400 cases showed properly filled roots and half of these again showed infected areas about the root end. Now that is a statement pure and simple, but where is the proof that these shadows are the unmistakable pictures of infection? Such deductions, and we are all more or less inclined to accept them as facts, are no proof whatever until such time as someone will prove to us beyond all doubt that these shadows always distinctly indicate infection; that when *they* are present *infection* is present and nothing else, and thus far that has by no means been done. Our methods of diagnosis, therefore, at present are far from correct or definite and statistics obtained in such a manner are of but little value. They only tend to mislead us in our deductions and in our efforts to arrive at correct solutions of problems before us. It is not scientific for men trained in scientific matters to jump at conclusions, or to accept as facts pathological phenomena when the methods employed and the deductions made therefrom are not based on scientifically proven facts. How many times do we find these darkened areas about root ends and on the sides of roots of teeth which have never been subjected to any sort of mechanical or therapeutic dental manipulation at all? We are apt to find such roots which are utilized as crown or bridge abutments, and again on finding slight shadows about them we are told invariably that it is a case of infection. Is that scientific deduction? Does this shadow about the root end always mean an infection and can it not designate something other than infection? To my mind there are a great many interpretations that may be just as correct. Excessive stress, and more often improperly fitted crowns and bands may be the cause of the production of a chronic state of stasis and the presence of more albuminous matter in the adjacent tissues due to leukocytosis. Is it not possible that the X-ray shows up such conditions in slight shadow lines? Then again, we find areas in our photographs about the apices of the teeth which have been crowned or banded in a quite thorough mechanical manner along the side of the root slightly darkened, and is usually diagnosed as an alveolitis pocket. This frequently is done in cases where although the bands and crowns are correctly and well fitted, the anatomical proper articulation has not been achieved, or the tooth may lean very much in faulty direction. Either of these two reason may produce a shadow line, or darkened area, but does such a condition really mean infection? Why may it not mean a chronic inflammation without any infection at all? Has stasis, hyperemia, and a deposit of fibrous elements nothing to do with the production of greater density in these tissues?

As I stated before, the use of arsenious acid as a devitalizing agent may, on account of our inability to gauge its limits and activities, cause the coagulation of some of the albuminous matter contained in the minute lymph spaces and channels of the tissues about the apex of such tooth, and the result be the presence of shadow lines or darkened areas on X-ray pictures?

The use of coagulating drugs and formalin surely may and probably does produce just such a tissue change. Roots thus properly treated and properly filled may show slight shadows on the X-ray film without proof positive that the cause of the irregularities in the picture is infection.

It seems difficult, therefore, at the present time to adhere to hard and fast rules just when we are to interpret these irregularities on pictures as really stages of dangerous infection, and when we are not to do so.

Undoubtedly all these newly awakened interests in modern ideas have had the one beneficent result in that they have stimulated us to approach devitalization of a tooth and its subsequent treatment with a far greater degree of trepidation and a feeling of far greater responsibility than we have been accustomed to heretofore. It has taxed our ingenuity and study of proper therapeutics, and has caused us to become more proficient in the matter of root canal work. Let us follow in that work the estimable scientific work of such men as M. L. Rhein and J. Callahan—let us be honest in our efforts, honest in our judgment, and above all else honest and scientific in our efforts to learn and study conditions to arrive at such conclusions that those following us in similar effort may without reserve take up the work where we left off and accept our statistics without reservation as their basis for reasoning. Let us develop our general fund of medical knowledge so that we can look the world of science steadfastly in the eye, with our conscience clear and with the assurance that our efforts are true and for the benefit of suffering mankind, and for the uplift of our own noble profession.

THE RELATION OF THE ROOT CANAL TO FOCAL INFECTION.*

BY L. SCHULTZ, M. D., D. D. S., CHICAGO, ILL.

The root canal has, up to a very short time ago, occupied a very minor position in the practice of dentistry, operators being satisfied if they succeeded in its treatment in making of the tooth in question a quiet, useful member of the masticatory family. Very little, if any, regard was had in the matter of observing strict asepsis, and sterilization of infected canals was believed to be complete when under treatment all symptoms of inflammation subsided. Statements appearing from time to time in the literature claiming a relationship between some chronic mouth infections and certain constitutional diseases did not make the desired impression, and Hunter's condemnation of American dentistry some years ago provoked a storm of protests, because the far reaching effects of focal infections, especially mouth infections upon the organism were not at that time appreciated nor understood. We all know that since then due appreciation and understanding has come to the profession owing to the researches made by such eminent men as Billings, Rosenow, Mayo, Gilmer and others, and that today the treatment of the root canal is the dominant question in the mind of every progressive practitioner of dentistry.

Root canals containing healthy, vital pulps do not per se give rise to focal infections, and so do not here come under consideration, although Hartzell[1] calls attention to the fact that he found such tooth-roots the seat of focal infection, such infection being hematogenous and having its origin in bacterial emboli coming either from the gum crevice or some other portal of entry. However, since neither the root canal proper nor its contents are responsible for such infections, a discussion of them does not properly come under the scope of this paper.

All root canals with content other than a healthy, vital pulp or a sterile, perfect filling must be considered, for all those may be or may become the focus of an infection capable of destroying the health and even the life of its owner. Nor does it matter what the contents of such canals may be, whether a putrescent pulp occupies that space or whether part of the necrotic mass remains with the balance filled with some root canal filling, or whether septic material of no matter what description fills the entire channel, the potentiality of such a root canal for evil remains the same, and so it must here be considered.

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*Read before the West Side Branch of the Chicago Dental Society, September 29th, 1916.

With the advent and latter day liberal use of the Roentgen ray in dentistry, a lamentable state of affairs has been revealed. According to some authors the roentgenogram discloses periapical lesions in from 65-85% of filled root canals and an even greater percentage of imperfectly filled canals. This, to me, is one of the most powerful proofs of the difficulty of accomplishing this operation properly. There seems to be very little, if any difference, whether the patient belongs to the better or the poorer classes of so called, or by whom the filling was inserted. The above holds true up to recent days, and I am well aware of the fact that men all over the country are using greater efforts, and with a greatly improved technic, including the help of the roentgenogram, are achieving what we now believe to be perfect root canal operations in probably 85-90% of their work.

That great care and much experience are necessary in the correct interpretation of the so-called X-ray is obvious, and I cannot emphasize too strongly the advisability on the part of every operator to take up a thorough study of the roentgenogram not only with a view to locating the teeth shown in the film, but also to find and correctly interpret all lesions shown by the picture. A careful operator will want more, however, than the roentgenogram to make a diagnosis. Such a film or plate can only show the difference between the shadows cast by the various objects exposed, which difference depends on the variations in density of those objects. He will want clinical evidence in addition, he will want all the subjective and objective symptoms present, before venturing a diagnosis. For example, a shadow appearing in the periapical area of a tooth or several teeth may mean perfectly normal bone in that individual, as a comparison with the bone in other places of the picture will show, the shadow being cast because the bone in those areas does not contain as much mineral matter as in others. Or that shadow may represent a healing focus or a healed focus, healed by a filling in with connective tissue, with no deposition of lime salts; or it may denote an active focus causing irreparable harm to your patient. Hence my advice to be cautious.

Obviously, the diagnosis cannot be made with certainty by the roentgenologist, for he lacks the clinical data so absolutely necessary for a correct diagnosis. Furthermore, an operator capable of correctly interpreting a roentgenogram does not need to have the roentgenologist denote on the card bearing the film that this particular film relates to the upper anterior teeth on the right side for instance, nor does he need to decorate the film with arrows pointing to possible sites of trouble, nor does he finally have to append a statement of all that he thinks he sees in the picture.

These remarks are not intended to be disparaging to the roentgenologist, whose knowledge of roentgenograms I value highly and whom I would consult unhesitatingly if occasion warranted. Indeed, I strongly recommend that every operator should consult the roentgenologist until he has mastered the correct interpretation of the roentgenogram. The correct interpretation of such pictures is of the utmost importance, especially with reference to the detection of foci of infection in the teeth and their adnexa, in view of the epoch making work of such men as Billings, Rosenow and others.

I am not going to take up your time to recite in detail all that these men have done in this respect, for we are all more or less familiar with it. But, let me briefly state, that they have shown beyond a doubt that from such foci may come constitutional as well as remote local diseases of very grave importance. These foci, however, do not relate to the teeth and their contiguous parts alone, but the tonsils, the accessory sinuses of the nose, the gall bladder, appendix, prostate, fallopian tubes, may just as well furnish the particular focus of infection to which such systemic disturbance owes its existence. I must also emphasize the fact that, in these researches, Koch's postulates were fulfilled, assuring acceptance of the findings in the scientific world. Nor has clinical proof to substantiate their claim been wanting since the result of their research became known. Often the secondary lesions clear up as the primary foci are eliminated; especially is this true in those cases where no permanent, incurable, anatomical changes have taken place. You are all familiar with some of these secondary effects of focal infections such as the various arthritides commonly known as rheumatism, also endocarditis, neuritis, nephritis, etc., but other diseases not so frequently met with in print in connection with these focal infections may be of interest. Ravitch[2] calls attention to the possible relation of focal infections to various diseases of the skin; namely, certain dermatoses, such as herpes zoster and lichen planus, also various erythemata, etc., clearing up after the eradication of those foci when before they were intractable. Iritis has been found to be dependent upon such foci, and has been produced in animals by Rosenow,[3] also by Irons, Brown and Nadler,[4] by the injection of the organisms found in them.

We must not, however, lose sight of the fact that while we know that those seemingly remote lesions often have their etiology in some focus of infection, they do not all enjoy such causative factors. Nor should we forget that even though they do depend upon such a focus for their being, that that focus does not necessarily reside in the mouth, nor residing in the mouth relate to the teeth. Billings[5] says: "I think we should not use the word 'cause' too much in relation to the focus of infection of a systemic disease. We should not, even with the focus before us, say that that focus is the absolute cause."

But to return to the teeth. What kind of root canals have a direct relation to foci of infection, which we may find about their apices? I will give you a few examples. First, those upon which Dr. Soederberg's method or any other method of pulp mummification has been practised. Second, canals filled with such nostra as Oxpara, Pustolene, etc.; those filled with medicated or non-medicated cements, via the Jiffy tube route or otherwise; those filled with such undesirable filling materials as sterile (?) or septic cotton, medicated or non-medicated cotton, Gates Glidden drills or any other kind of drill, broaches, gold or copper wires, or instruments of any description, or even canals partially filled with good filling materials of which gutta percha is the representative. Canals filled without the use of the rubber dam strictly according to *septic,* not aseptic methods; canals in which cohabitation of necrotic pulp tissue and filling material is permitted; finally canals perforated at the side and perforated pulp chambers. I think you will all agree with me that all such canals are prone to furnish ideal conditions for the establishment of foci of infection.

Every focus of infection must be regarded as a source of harm, nor does the amount of mischief caused by any focus depend upon its size. A very small, nay, an invisible rarefaction may be the cause of very serious disturbance, for the potential trouble residing in such an area does not depend so much on the size of the lesion as shown in the roentgenogram as it does upon the virulence of the organism, and the amount of defense the patient is able to offer. Besides we must bear in mind that a focus of infection at a root end may escape detection altogether, if the overlying bone casts sufficient shadow to hide the rarefaction, since the roentgenogram simply shows a difference in shadows. So we find that it is impossible to measure the influence of these foci upon the general health of the individual or to estimate the possible consequences of any infection no matter how insignificant it may appear.

To sum up, then, let me say that pulpless root canals of whatever kind and made pulpless by whatever agency are the most fruitful cause of infection and abscess formation, unless they are rendered sterile and are perfectly filled with a non-septic filling material. Root canals containing vital pulps may perhaps become the seat of abscesses through the lodgment of bacterial emboli in the end arteries contained in the peridental membrane, but this latter condition must be rare. These abscesses may be acute or chronic and of these varieties the chronic is the one which interests us here. Of this chronic variety there are two kinds: the abscess with a sinus leading to the surface, and the so-called blind abscess. Now while an abscess with a sinus cannot be regarded as harmless by any means, it is not nearly as harmful as is the blind abscess, for in this type of infection both bacteria and toxins are absorbed by the lymphatics or blood stream or both, and the systemic disturbances are likely to be more serious than where the pus, etc., is discharged onto the surface and swallowed. I am not unmindful of the damage done to the gastric mucosa or the entire alimentary tract, for that matter when burdened with such noxious material, but in comparison the blind abscess is the worst.

As to the type of infection present in these chronic abscesses, it is of interest to note that some strain of streptococcus is the organism found in most cases, usually the S. viridans or the S. hemolyticus as shown by Hartzell and Henrici,[6] Ulrich,[7] Rosenow,[8] Gilmer and Moody[9] and others. With our knowledge of the power of mutation which these bacteria possess, and the selective affinity which they develop for certain structures of the body, as shown by Rosenow, comes an appreciation of the possibility of widespread damage, which may result from such foci, and of the necessity of eliminating that menace, wherever found, at any cost.

It is obvious that root canals filled as they have been in the past have contributed to, in fact have been almost the sole cause of the coming into being of these abscesses and that not because of negligence on the part of the profession but because the subject was not understood as it is now. The operation of filling a root canal was considered of very minor importance, usually the pulp tissue was but partially removed, strict asepsis was not observed, the operator being content with being ordinarily clean, not surgically clean. Often the use of the rubber dam was dispensed with and root canals treated and filled with a lot of infected and decayed material residing in the crown of the tooth throughout such treatment. In fact there seemed to be a belief that all was well as long as the tooth was quiet and that if all of the root was not filled, the Lord would take care of the unfilled part, but we now find that these unprotected root ends are just as much subject to the laws of nature as are all other parts of our body. Root canals aseptic to begin with, because harboring a vital pulp, were infected when devitalized by these methods and the infection was sealed in by the filling, or infected canals were inadequately sterilized and filled. Abscesses with a discharging sinus were irrigated, the sinus cauterized, and when it healed the root canal was filled in the belief that all was well, when as a matter of fact a small suppurating area having free drainage was often converted into a vastly more vicious type of lesion, a blind abscess. We see from the foregoing that the treatment of root canals by the average practitioner has up to the present time fallen very much short of what in the light of our present knowledge must be done to prevent as much as possible the occurrence of such foci of infection.

What, then, shall we do in order to live up to the highest ideals of present day dentistry? First of all, let us prevent as much as possible the occurrence of pulp death by infection, and the necessity of pulp devitalization by the practice of oral prophylaxis. Let us realize that mouth hygiene is more important than restorations, crowns or bridges, and let us make our patients realize it. Let us prove to our patients that "A clean tooth never decays," by our methods of practice. Let us insist on often repeated thorough examinations. Let us eliminate pyorrhea by eradicating its first symptom, that little area of inflammation at the gingivae. Let us keep the teeth highly polished and tolerate no shoulders about the margins of fillings, etc. By such treatment we would prevent the loss of dental organs and make most fillings unnecessary and render crowns, bridges and plates obsolete, thus accomplishing a great deal more than we could possibly hope to do with the best root fillings, restorations and all other devices known to us to replace the lost. Such, I am sure, will be the dentistry of the future. Such is our ideal now. But unfortunately conditions confront us today which call for pulp extraction and the saving of teeth with infected pulp canals. For, after all, we should save all those teeth which can be saved without jeopardizing the patient's health.

Having decided that a certain tooth showing a bone cavity on its root end can be saved, our first aim must be to eradicate the infection, and to do this we must penetrate the apices of its root canals so that an efficient germicide may be sealed in to sterilize the abscess. This should never be undertaken without the use of the rubber dam, the removal of all carious dentin, the opening of the pulp chamber so that the beginning of all root canals may directly be seen by the operator; sterilization and filling of the canals being accomplished according to the approved methods of today in order to reach the desired goal; namely, the sterile hermetic filling of what has been called the strategical point, the root apex. If resection of the apex is indicated, this should not be done until all other work on the tooth is finished, including the insertion of a permanent filling or a crown, as the case may be.

In this connection let me emphasize the liberal use of the roentgenogram. A patient presenting, all doubtful teeth should be subjected to the Roentgen ray to help determine the treatment necessary for the condition present. Those whose root canals are being treated should again be exposed, with the broach in the canals if necessary. After filling the root canals they should *always* be exposed to show whether or not they are properly filled. If not, they should be refilled until the roentgenogram shows perfectly filled canals. Where a rarefaction of bone exists, repeated roentgenograms should be made after filling the root canal at intervals of from three to six months, and the films compared in order to determine if that focus is healing, has healed, or if further interference is necessary.

In every case where complete and permanent eradication of infection cannot be accomplished by the measures outlined above, the only one safe rule to follow is to extract the tooth and where necessary do a curettage of the infected area. This also applies to those cases in which the patient suffering severely from systemic poisoning, which may be due to such foci, is not in a condition to carry the infection until it can be eliminated therapeutically, or where on account of his systemic disturbance therapeutic measures cannot be applied. Needless to say, these films should be filed for record with at least name of patient and date of exposure as guides, so that comparison may be made

In conclusion, let me urge upon all of you a close co-operation with the family physician, for in all cases the patient's interests are best served by team work between the physician and dentist, neither of whom is able alone to serve his patient as well as he can in consultation with his professional brother. Such co-operation should consist in one or more consultations—not at long distance as per telephone or mail, but actual consultations at which the best treatment for the patient's welfare should be devised.

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IMPROVED TECHNIQUE IN PALATAL OPERATIONS.*

BY TRUMAN W. BROPHY, M. D., D. D. S., LL. D., F. A. C. S., SC. D.

The diseases, injuries and malformations of the mouth are claiming more attention today from the medical and dental professions than ever before. It is, therefore, of the utmost importance that a greater amount of time be given to the teaching of these subjects in both medical and dental schools. Anything that pertains to the mouth in the way of an injury, malformation or disease must necessarily be studied by the practitioner of dentistry if he would attain the greatest degree of success in his profession.

In medical institutions these subjects receive little or no consideration. Medical graduates, even of the better class of schools, frankly admit that they have not been instructed in these branches. Consequently errors in diagnosis are not infrequently made, for the want of such knowledge. Fractures of the mandible, dislocations of the temporomandibular articulation and other injuries too frequently are passed lightly by, much to the detriment of the patient who may seek the services of the young physician.

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*Read before the Chicago Dental Society, October, 1916.

Where departments in college are elective, the medical student usually chooses branches in which he is interested, to the exclusion of very valuable instruction in other branches, a knowledge of which he will later need. The dental student fixes his vision upon a lucrative practice which, with his immature understanding, he believes can be acquired if he learns only a part of the branches taught in his dental school. The scientific laboratory, the dissecting room, lectures and clinics in surgery, as a rule, have no allurements for him. If he can learn to make inlays, fillings, crowns, bridges, know something of orthodontia, and have an extremely limited acquaintance with pathology, he feels that he is prepared to meet the requirements of a dental practitioner. This should not be so.

Summing up the work of both medical and dental students, we find the fact exists that a large percentage of dental students would not study general pathology if it were not compulsory; while the medical student, as I have previously stated, has little or no knowledge of dental pathology, because the medical colleges, with few exceptions, do not teach it. This being true, it is not difficult to understand that a large majority of medical and dental students have a very limited knowledge of oral maladies.

It is not just to criticise a practitioner for a lack of knowledge of a subject which the college that he attended and from which he graduated did not teach. A revision and expansion of the curricula of both medical and dental schools should be made in order to meet the present requirements.

The dentist should be, and many are, interested in the surgery of the mouth, whether it is for the correction of diseases, injuries, or malformations. I am, therefore, bringing to your attention tonight a subject to which I have given a great deal of thought and study.

Since the first operation on cleft palate, in 1764 by La Monier, few changes were made in technique until Sir William Fergusson suggested and practiced the division of the muscles of the palate in order to relieve the tension with a view to preventing the cutting out of sutures, a procedure which, in the light of our present knowledge, is wholly unnecessary. Yet, the teaching of Fergusson, Langenbeck, the Warrens, Agnew and others is still practiced by some. Years ago it was declared by eminent surgeons that 85 per cent of such operations were failures—that is, the surgeon failed to secure a union of the separated segments of the palate.

What is a cleft palate? A separation. Not necessarily arrested development nor incomplete development, but a separation, usually of well developed parts. A cleft of the palate is like a wound. If a child were thrown from a vehicle, the lip and upper jaw separated and driven apart, the condition would be like a congenital cleft palate. There is no doubt that the first impulse of the surgeon under such conditions would be to move the separated parts together, retain them in position and secure union. But if the separation were congenital, the teachings have been to close the lip and permit the separated bones to so remain. The patient's condition under such treatment can never be normal; the parts will never unite; the arch almost invariably remains abnormal. The question which a surgeon must decide, in such a case, is, how and when to operate so as to make it normal.

In a personal communication bearing upon the condition of complete cleft palate in infants, Professor Arthur Keith, curator of the Royal College of Surgeons of London, writes: "I agree with you that in the majority of cases of complete cleft of the palate there is no deficiency of tissue at birth nor for some time after birth. I also agree that the cleft, however wide, is not due to a deficiency of tissue in the several elements which go to form the palate, but is entirely due to the fact that when the various embryonal parts or elements are developed and come together in the second month of development, the process of union, which should occur then by a means similar to union by first intention, is delayed and does not take place, hence the several palatal elements, being incoordinated by union, tend to separate as growth occurs, the cleft increasing during each month of growth. The exact cause of the separation of the parts and the enlargement of the cleft is probably due to several factors, tongue pressure, muscle traction and also the independent process of growth in each individual part.

"Theoretically the best treatment ought to be to bring about union at the very earliest date, but theory and practice may not be easily harmonized. To lay down the lines of treatment is beyond my province and my experience. I simply note the fact that three men whose opinion I value—yourself and Arbuthnot Lane on the one hand and James Berry on the other—have reached diametrically opposite conclusions as to which is the best time to operate. Still, that does not influence me in agreeing with you that to secure a good palate the sooner the cleft is remedied in complete cases, the better the result ought to be."

I regard the statements of Dr. Keith as further proof of the declaration made by me many years ago, that cleft palate is not the result of arrested development or insufficient tissue to form a normal palate, the views of many authors to the contrary notwithstanding. I am sure that anyone interested enough to enter into a careful investigation of this subject, no matter what his previous opinions may have been, will be convinced that at birth a cleft palate, with rare exceptions, has in it sufficient tissue to form a normal palate and that the abnormality is only a separation of well-developed parts.

We will not go into detail in describing the etiology of this deformity, but I wish to point out my most recent technique.

There are fifteen forms of cleft palate, all of which should be operated, except the last—as shown later on the screen. The improved technique which I will illustrate has reduced the mortality to the minimum. Of the last two hundred and twenty-five operations there were only four deaths, and those occurred several weeks later. I attribute this in part to my refusal to operate upon a patient until after I have become thoroughly familiar with the physical condition, never operating on a sick child.

I would summarize the operations on cleft palate in the following general principles:

1. Every surgical operation should be so performed that the parts will be left in as nearly a normal condition as possible.

2. The majority of children brought to the hospital for

operation are not well. They require treatment, care and preparation.

3. A cleft palate, whether single or double, which separates the alveolar processes, should be operated and the bones united in early infancy, preferably before the patient is five months old—altnough experience in the past few years has convinced me that children as old as three years may have the widely separated bones moved together, by passing wire sutures through the bones and making pressure upon lead plates from time to time.

4. If the bones are united in early infancy, the parts may be brought into more nearly normal condition than by any other operation. If the lip is operated upon first, it conceals the cleft palate, the greater deformity, but it does not cure it.

5. An operation which is followed by union of the segments of the palate is not a success and is of little value to the patient unless the palate is made long enough to extend back to the post-pharyngal wall.

6. Lateral incisions for the relief of tension are unnecessary and besides they leave permanent defects.

There are men who argue against the bringing together the separated bones and uniting them who in many instances have never performed the operation. If they had, and failed, it was without the use of proper instruments and without a knowledge of the technique necessary to make the operation a success.

When I was a student in Philadelphia, it was my privilege to listen to the instruction of the great father of American surgery, Professor S. D. Gross, of the Jefferson Medical College, and his associate, Professor Pancoast—both authors of international fame. I also listened to Professor Pancoast's son, William Pancoast. I also had the great privilege of listening to Professor D. Hayes Agnew of the University of Pennsylvania, and among other surgeons of international distinction Professor James E. Garretson.

After finishing my course of study in Philadelphia I visited New York and there attended the clinics of the noted men of their time, among whom was Dr. Louis Sayre, the most noted orthopedic surgeon of his day. While in his clinic a young mother brought her child one day and placed it in his hands. He held it up before the class and said:

"Gentlemen, this child has one of the most conspicuous deformities known to mankind. You will observe it has a prominence of the upper lip which extends beyond the end of the nose. This extension is composed of the premaxillary bones. The lip, you will see, is divided upon both sides. The child has double harelip. The palate is so divided that the vomer is not united at either side, a condition described by some authors as a double cleft of the palate—a most distressing condition."

Then, placing his strong hand over the child's face, he made pressure with his thumb and finger, calling the attention of the class to the fact that these bones might be moved toward each other, and he exclaimed, "If I make pressure upon these bones they will spring toward each other. If we had some way by which these bones might be moved together and held there, we might be able to cure this deformity! But we have no means of doing so." The lip might be closed later, he declared, but did not state how much later.

The thought never left me that this unfortunate woman's deformed child could not be cured. The words of Professor Sayre rang in my ears from day to day, "We can spring these bones together. If we had some way by which we might approximate them and hold them there, we could cure the patient, but there is no way of doing it." Twelve years later I undertook to move the bones together, operating upon a child ten days old. I did then what I would not undertake to do now. I not only moved the maxillary bones together, but I closed the palate throughout its entire length. The child made a good recovery, growing up to young womanhood and becoming quite a celebrity in her neighborhood as a vocalist. Had the child succumbed to the operation I might have been severely criticised for operating as I did. The success of this operation stimulated me to make others.

Going on from time to time I found it necessary to construct instruments especially adapted to my work, as there were none in the surgical instrument shops to serve my purpose. Those I have made recently are great improvements upon those formerly employed.

A DENTIST'S HELP AT THE ITALIAN FRONT.

BY CAPTAIN ARRIGO PIPERNO, M. D., D. D. S.
Head of the odonto-stomatological department of the
Italian Red Cross Hospital of War N. 4.

Stomatological cases are very frequent among the wounded. Immediate treatment has been proved to be very useful to them. In an advanced hospital the immediate treatment must be a treatment of urgency, of course, in order to give places to the new-coming wounded. When the application is possible, the Angle's bow with molar bands and ligatures (Angle-Sauer's method) is a very easy method of treatment in fractures of the jaws. In cases of fractures of the angle or the ramus of the lower jaw my emergency heavy losses of the lower jaw I modified the Gunning's splint in two articulated splints, one for the upper maxilla, with four pillars, one for the lower, with four pockets, where the upper pillars take support. Both splints are of vulcanized rubber (fig. 1) and are fixed in place with cement. The separation of the splints allows the opening of the mouth for dressing the wound, so important in the first days of the trauma, permitting at that time the free movement of the temporo-mandibular articulation. At the moments of rest, the high pillars inserted in the four pockets give the open bite aptitude which tends to steady the apparatus (fig. 2). In cases of

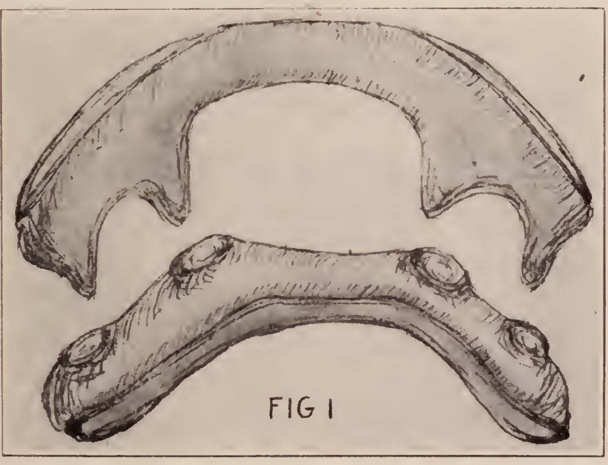
FIG 1

method of choice is the metallic intermaxillary ligature which fastens the lower maxilla to the upper. This method, adopted since the XIIIth century by Whilhelmus of Piacenza, Italy, has been successfully followed by modern operators (Lemaire, Leblanc, Gilmer, A. D. Black, Power, Oliver, Graham, etc.).

My procedure is very simple. I encircle, if possible, the four bicuspids of one side with single loops of Angle's ligature wire (figs. 3, 4), then I wire together the two ligatures of the upper teeth (fig. 5) and the two ligatures of the lower, ligating at last the resulting upper ligature with the resulting lower ligature (fig. 6), holding in perfect anatomical relation the lower to the upper maxilla.

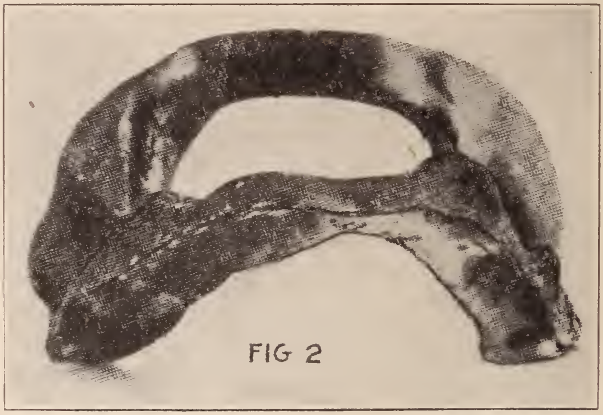
FIG 2

In this condition the patient can be notified as a transportable wounded, and is ready to be conveyed to territorial hospitals.

Dental treatment is highly appreciated by soldiers at the front, relieving them from the torture of tooth-ache. My motto is: quick and well—in order to avoid vacancies to the troops. I am proud of giving conservative treatment as much as possible: extractions are done in cases of pericementitis, or abscessed teeth or roots. Decayed teeth with caries of first or second degree are filled at once with amalgam, those with exposed pulps receive an arsenic treatment at the first sitting; in a second sitting, after two days of the arsenical application, we extract the pulp, dress the canals with phenol and fill them (the bigger ones) with guttapercha cones moistened with trikresor-formalin paste and fill the cavity with amalgam or cement. In occasional cases, when hemorrhage does not stop after pulp extraction, I leave a phenol dressing in the canal until a third final sitting. All temporary dressings during treatments are done with alcoholic solution of sandarac. In cases of putrescent pulps I apply Dr. Buckley's forma-cresol liquid at the first sitting after a large opening and cleaning of the cavity: then I close with cotton and sandarac. At the second sitting I clean the large canals with dry cotton until it comes back perfectly clean and dry, avoiding moistened dressings. I am careful not to force any liquid through the apical foramen. Then the canals and cavities are closed as before, after having gently pressed some trikresol-formalin paste over the openings of the small canals. In occasional cases, when the cotton does not come back clean and dry from the canal, I leave a trikresol dressing until the third and final sitting.

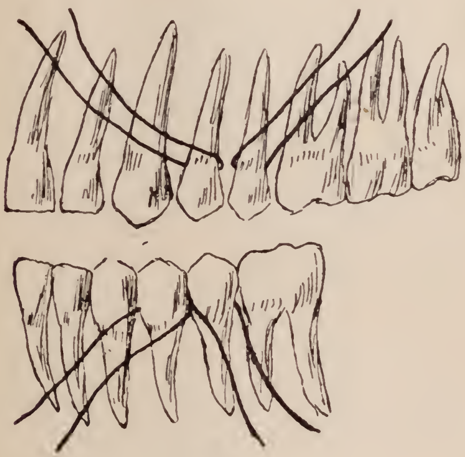

Fig. 3

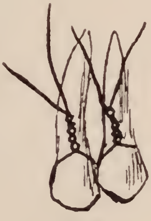

Fig. 4

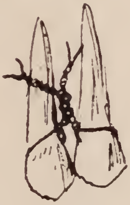

Fig. 5

I know that this very rapid method of dental treatment is in contrast with Dr. Rhein's radiological views of filling canals. Dr. Rhein is right in his accurate treatments and I am right too in my special conditions in a hospital of war where I want to give as many treatments as possible in the smallest amount of time. The fact is that very few soldiers (no more than four per cent) are coming back to our clinic requiring extractions of filled teeth which are painful from post-infection. With this kind of patients I do not believe in the advantage of sending them away with canal dressings. It is cleaner and safer to extract a devitalized pulp and fill the canal at once, than to give the patient the possibility of a pericemental infection from pressure during the mastication of food. For the same reason I try to avoid moistened canal dressings in canals with putrescent pulps. I feel sure, in exposing these practical ideas, to have the forgiveness of my dear teacher, Dr. J. P. Buckley of Chicago.

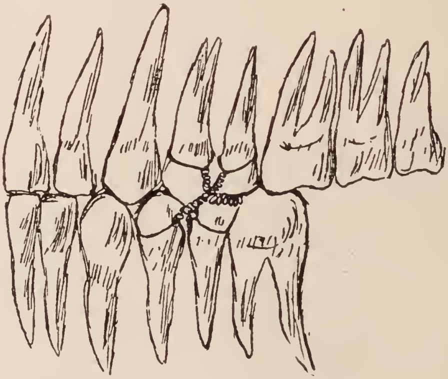

Fig 6

To every military man coming to my clinic of war I give a printed pamphlet with a brief decalog explaining the hygiene of the mouth.

In the last four months (July-October, 1916) in the department of conservative dentistry I, with my assistant lieutenant, have performed the following operations:

	July	August	September	October	Total number of patients	Total number of operations
Number of patients	624	737	655	727	2743	
Cleanings of teeth	40	62	44	45		191
Pyorrhea treatments	11	8	10	11		40
Injections	2	2	3	1		8
Teeth extractions	50	49	64	41		204
Roots extractions	44	49	56	98		247
Simple dressings	297	385	235	243		1160
Arsenical dressings	82	99	108	98		387

Canal dressings	99	145	139	132		515
Abscess treatment	5	7	7	10		29
Pulp extractions	63	45	73	66		247
Canal fillings	60	66	77	65		268
Guttapercha fillings	..	1	5	8		14
Enamel fillings	2	2	3	6		13
Cement fillings	60	88	138	92		378
Amalgam fillings	164	114	84	173		535
Consultations	5	4	8	18		35
Prosthetic apparatus	6	4	6	4		20
Total	990	1130	1060	1111		4291

November 1st, 1916.

PRESIDENT'S ADDRESS.

BY P. J. KESTER, D. D. S., CHICAGO, ILL.

Mr. President and Members of the Odontological Society:

Another year of awful strife in the outer world has passed, since our last annual meeting, while we within the seclusion of our circle are at peace with all the world; no untoward events have marred the record of our being, and we meet again, as is our custom, hence to the president falls the duty of reviewing the work of the society for the past year.

But first let me voice the deep sense of gratitude I feel for the honor conferred upon me by this society and the delightful friendship and good fellowship you have bestowed on me.

A membership in this society means more to me than I can express, out of the kindness of your hearts you have honored me, and out of the depths of mine I thank you.

The profession has moved ahead with such great strides, that it requires the constant endeavor of its members to keep abreast of the times. You need the everyday contact with the work to arouse your interest, and stimulate you to the mastery of the ever present difficulties.

Dentistry has become complex and scientific, beyond the imagination of the dentist of twenty years ago.

Your secretary has made it extremely easy for the members of this society, as during the past year, no member has prepared or read a paper at any of its meetings, excepting perhaps, the very excellent annual address of our retiring president, Dr. E. A. Royce.

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*Read before the Odontological Society of Chicago Nov. 7, 1916.

I have been puzzling my brain as to whether his paper belongs to this year or last, but the more I think about it, the more I believe it was last year.

I had hoped that our resourceful secretary might evolve a scheme, whereby your president might escape, but I presume he did not want to do anything unconstitutional, as the duty of the president is clearly set forth in our by-laws, viz:

"It shall be the duty of the president to deliver an address at the annual meeting, reviewing the work of the society, or summarizing the discoveries and progress made during the year."

Your president chooses to confine himself to the first part of the duty as outlined above, it looks easiest.

At the November meeting Dr. E. A. Royce, the retiring president, delivered the annual address which was fully enjoyed by the members, while the advice that he gave, and the suggestions he made, indicated that he had the best interests of the society at heart.

At the December meeting Dr. H. H. Schuhmann presented a paper entitled, "Diabetes from the standpoint of the Dentist," in which he described the various lesions, and pathological changes apparent in the mouth, in the earlier stages of diabetes, and stated that the early recognition of these symptoms, would be of benefit to the patient.

Dr. Goodkind of Chicago, also a guest of the society, discussed the paper, amplifying, emphasizing, and corroborating the position of the essayist, after which the paper was fully discussed by the members.

The February meeting was made memorable, by the number of guests that were present at the meeting, the number being five.

The essayist, Dr. R. I. Lewis, read a paper, the subject being, "Interpretation of X-ray pictures," with many illustrations.

Your president has such a meager knowledge of the subject, that a review by him would be valueless, but judging by the discussion that followed, by the visitors and the members it was evident that the subject was an important one.

The March meeting was a slight departure from the usual, as Dr. Harms made an address on the "Pathology of Pyorrhea and Abscess."

This was an instructive and interesting dissertation on the subject, and was discussed by Dr. Warren and the members.

At the April meeting we were again favored with the presence of Dr. Schuhmann, who read a very able paper, the subject being, "Vincent's Angina."

In May the society did not hold a regular meeting, but accepted an invitation to dine at the North Shore Hospital, as the guests of the Drs. Beck.

The dinner was delightful, but was only the preparation for an evening of great interest. Cases were exhibited, methods explained, and an invitation to witness a surgical clinic, was accepted.

The last hour was spent in their pathological laboratory, where many new and interesting subjects were being investigated. Altogether this evening to your president, was one of the most profitable of the year.

The June meeting was a red letter day for the members of our society, as we were the guests of our honorary member, Dr. W. V-B. Ames, who entertained us royally at the Exmoor Golf Club on Saturday, with a banquet in the evening, and a day at Briar Ridge Farm which will long be recalled as one of the most delightful of all days, to be remembered and cherished, and the vote of thanks of the society was a partial expression of our very hearty appreciation.

The October meeting was unavoidably postponed, and that brings us to the thirty-third annual meeting of our society.

Since the organization of our society many changes have taken place, many of our loved members have passed to the beyond, but they are ever present with us in spirit, and the records they have made will live as long as our profession lives, and the friendship and fellowship of these dear men will live in our hearts, as a benediction, until we too shall have solved the great mystery.

BUSINESS EFFICIENCY IN DENTAL PRACTICE.*

BY BERT H. KERSHAW, D. D. S., CHICAGO.

Madam President and Members:

In coming before this society this evening I have no apologies to offer, neither am I laying claim to anything new or novel, but merely with a view of further instilling into the minds of my auditors the necessity of more diligent research work along the lines of business efficiency in dental practice. This is to my mind equally as important as the research work being done in various other directions by members of our profession, the results of which accrue mostly to the benefit of our patients and for which benefits they usually are inclined to compensate us with as low a fee as we are willing they should get away with, and in far too many instances with no compensation whatsoever. Therefore, I say it is high time the dentist began a little research work in his own behalf to discover the particular micro-organism that is undermining his financial system, and having found the cause apply the specific necessary to annihilate it.

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*Read before the Kenwood Dental Society.

The word Habit is defined in the Standard Dictionary as a "tendency or aptitude for the performance of certain actions acquired by custom." Applied to the present status of the dental profession as a whole, this definition has a special significance as is attested by the financial standing of the great majority of dentists as compared to the financial standing of men in other walks of life, who have not put in half the time nor been to half the expense in fitting themselves for their life work. This difference in financial standing is all explained by the business man having schooled himself in the proper habit or custom of conducting his business, while the dentist has paid little or no attention to the proper method of conducting his practice as far as the financial returns are concerned.

The Cause. The primary cause of the dentist not being able to properly cope with the financial end of his practice is that his alma mater has not provided in her curriculum for a course in the proper conduct of office practice with particular reference to finances, which course could be brought within the scope of the most exacting ethics, and in considering a four-year course our colleges could do no better than to put in a good share of the added time in equipping the student to properly conduct the business side of his practice.

The secondary cause lies either in the dentist not applying what business principles he may know, or their misapplication, either of which spells failure. In other words, the great mass of dentists have *bad habits* in the conduct of the business portion of their practice. The incompetent management of the business side of any dental practice means lack of a competency for the declining years. This becomes a serious question to the dentist who has arrived at full practice with only having given the financial side but small consideration, as compared with the time spent in bringing himself to a high state of proficiency that he may better serve his clientele, and this with practically little or no increase in his fees. It is far better for a dentist to have it said, "He is high priced but he does good work," than "He is a good dentist and his fees are low." In the first instance he will attract people who will come prepared to pay a good fee, while in the second he will get a mediocre clientele and work himself to death trying to make ends meet, while the higher class of patients from whom he could obtain the proper fee will be conspicuous by their absence.

You must agree that there is nothing in working for nothing, that is plain, and still every dentist who does not get full compensation for every income hour is cheating himself and those dependent on him. What the patient *does not* pay, the dentist *must* pay. I think we will all agree on that, and now that we are on the subject of fees, let us see what constitutes a just fee and how we must arrive at it in order to do justice to ourselves as well as to our patient. In order to arrive at a satisfactory solution of the problem of what constitutes a just compensation for a given piece of work it becomes necessary for the dentist to determine for his own individual practice the following factors: The cost of his college career, including tuition, expenses, and what he would have earned during the period he was in college. To this he must add the value of his office equipment, which will give him the sum total of his original investment. Then he must ascertain the annual cost of running the office and to this he must add what he considers he should earn as a salary. After having properly computed these items he should add a sum for the annual depreciation and 10% on the original investment, which sum will give him the basis upon which to calculate the fee he must charge per hour if he is to come out whole at the end of the year. This will be the minimum fee and he should see to it that he does not deviate from this fee.

The average annual working time of the dentist is 2,000 hours per year, making deductions for vacation, dental meetings, broken appointments, etc., so it should be an easy matter to determine his hourly fee, as he simply has to divide the total running cost by the number of income producing hours, and he will have the correct minimum fee he should charge. Having arrived at the proper hourly remuneration, the next step is to put it into execution and this he will find to be no easy matter at first, especially with old patients, and right here I might say that he must not let fear of losing a patient cause him to lower his fee—far better lose the patient than work at a loss.

One of the best methods I have found in dealing with patients, whether they be new or old, is to simply ask them when they apply for services, "How much do you wish to spend on your mouth?" This usually brings the reply that they want to have their mouths put in the best possible condition whatever the expense may be, and leaves the dentist open to put forth his best efforts or they will come back with some such reply as this, "Well, doctor, how much will it cost to put my mouth in first-class shape?" or "How many different grades of work have you?" and "What would you suggest in my case?" At any rate it brings the matter down to a definite basis and creates an understanding as regards the fee at the outset. This part being settled, it is well to say here, "Now, you may pay this so much down and the balance when the work is finished," or a definite understanding may be had in regard to payments at stipulated periods as the work progresses. It is far better to have a definite understanding at the outset than a misunderstanding at the finish.

The psychical effect of being well paid for one's work is as an elixir which bolsters one's enthusiasm in his work and makes for far better dentistry on the one hand, while on the other hand the poorly paid dentist, no matter how efficient his work may be, soon becomes discouraged at his financial progress and gets into the "don't care" class, and does slip-shod work for what he can get for it, and lets it go at that. In either case it is up to the dentist himself, whether he is well or poorly paid, provided always of course that he renders good service. A good bank account is a good friend and backed by it one has more courage to ask the proper fee for his services without the fear that he may not be able to pull through the month if he loses that particular patient. A few days ago, one of my old patients whom I had not seen since I raised my fees, came in and had some work done, and upon receiving her bill she came right down to the office to see me and the scene opened something like this.

"Why doctor! I was perfectly amazed at your bill; why you never used to charge for treatments, and besides you know papa isn't paying my bills now." After she got all through with her explosion, I simply said that I had always charged her for treatments, but that it did not always appear on the bill as a treatment, and I also let her know that treatments were higher than they used to be, because we had gradually come to realize that the whole life of the work that was to be supported by the root that was treated and filled, depended upon how well and how thoroughly the treating and root filling was done, and that therefore it was worth more than any other part of the work. I also asked her, "Suppose you had worked 20 years in one position, would you not expect a raise in salary in that length of time?" "Well," she said, "I had never looked at it in that light, I guess you are right." And with this comment she paid her bill. Now if I never see this patient again, I have been paid in full, at the proper rate per income hour, and if she ever does return, she will understand my charges, and there will be no haggling over the fee.

Another very important item in the efficient management of office practice is proper and up to date equipment, and here we must give the dental manufacturer full credit; for if it were not for him we would not have the great variety of office furniture and equipment to select from, and let me say that this proper furnishing of your office plays no small part in the matter of the class of your clientele.

This paper would hardly be complete without saying something on the subject of service-selling and collections. Service-selling in dentistry is the same as the sale of other commodities in the commercial world, as far as selling goes; the best salesman sells the most goods and gets the best salary for his ability as a salesman, but the best dentist does not always make the best income, unless he combines the art of salesmanship with his professional skill.

In selling service it is necessary for the dentist to create in his patient's mind a desire for the service the dentist proposes to render and that this service is going to be of sufficient benefit to be well worth the amount the dentist is asking him to invest.

The patient has a right to know these points, the same as he has a right to know the good points and conveniences about the car he may propose buying. The dentist who can bring up convincing arguments in favor of whatever work he proposes doing for each individual case and back it up with first class work, will find as a usual thing that he will have no trouble in selling his service at the proper fee; and having established this fact to his clientele he will have less trouble with fees as time goes on, as these patients for whom he has worked usually recommend people who appreciate good service, and are willing and able to pay the fee.

In the matter of collections the bug-a-boo of every dentist, we come to another phase of the business side of dental practice which again is up to the dentist, as to how he handles it. We all have the appreciative patient who pays his bill promptly; the patient who is slow pay, and takes so long in paying, that by the time the bill is paid he is back for more work; the patient who partially pays his bill, and then when the collector calls informs him that the work is not satisfactory; and the patient who is a dead beat and never pays, and never intends to.

The thing to be desired is the patient who pays promptly and the rest should be eliminated, and in my practice I am striving to do this very thing, and the only way to do this is to have every new applicant for our services furnish references; failing in this it is good practice to immediately have them looked up through some good credit agency, and if furnished with an adverse report from the agency inform them on the second visit that you do work only for cash in advance; and why not? Are they not obliged to settle for many other commodities in advance, and is not our work necessary to their welfare, and is there any good reason why we should be bilked out of what is our just due, by unscrupulous individuals who make a business of preying on their fellow man whenever the opportunity presents? I say most emphatically, no! Our own laxity in business methods is the only reason we are carrying on our books people for whom we have given our best efforts and who care not one whit, whether we survive or perish. I for one have turned over a new leaf in this direction, and I trust you may all go and do likewise.

PRESIDENT'S ADDRESS.*

BY F. H. BOWERS, D. D. S., FREEPORT, ILL.

Members of the Northern Illinois Dental Society, Ladies and Gentlemen:—

How rapidly the second hand ticks a minute.
How rapidly the minute hand ticks an hour—
How rapidly the hours make a day and the days a week,
The weeks a month and the months a year.

Have you noticed how rapidly the years pass away? We must work rapidly to accomplish all our undertakings. It is a very short time since last year when we mingled together at our twenty-eighth meeting in Freeport. Today Aurora welcomes us at our twenty-ninth meeting. What a glorious day—the weather is ideal. Have you ever noticed how the weather favors? It cheers and gladdens the heavy hearts. My depressed brothers, have you ever noticed in starting to your office in the morning the changes that will take place, the frown passes away, the corners of your mouth turn up and unconsciously you smile, just because the sun is shining. I am going a little farther; make up your mind to smile any day, anywhere, rain or shine. You can if you will, and gladden everyone with a smile. Cultivate a smile that won't wear off, and the world loves you.

Before going any farther I want to thank the members of this society for the honor they conferred upon, and the confidence they placed in me by electing me their President. I never chopped a cherry tree, I have my faults. I thank you from the bottom of my heart. I thoroughly appreciate this honor.

One man cannot run this society. It requires the hearty co-operation of all the officers and members to bring about an enthusiastic meeting. Now remember we are here on equal footing, you all have eyes and can see, ears have you and can hear, mouths have you and can speak. Speak, I pray you. I wish to thank Dr. B. H. Bigelow for his untiring efforts as Chairman of the program committee. Dr. Chas. S. Helm, Chairman of Clinics. I can imagine the return post cards and letters they have sent out, which have never been returned and yet they have never complained. Next year boys you will at least answer the invitations to participate in the program. Remember it is an honor. You older men who have never taken part in the program, remember you have a few ideas you would like to bring forth, only you have not received sufficient encouragement. You don't need any encouragement and if you make a mistake just laugh and we will all laugh with you. What a good time is in store. You younger members have good ideas you brought out from school. Now produce them in this society—come to the front, we need you and you need this society. I thank Dr. Wilson, Chairman of the local committee, for making this meeting a success. What an ideal place for a meeting. How good of the Rev. Buady to bless us—of the Honorable Mayor to welcome us. Last I wish to think Dr. C. L. Smith, the Secretary, for his untiring work. He is the power behind the throne to whom we should all pay homage.

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*Read before the Northern Illinois Dental Society at Aurora, Oct. 18. 1916.

SOCIETIES.

Thirteen years ago I joined my first dental society. Unfortunately in previous years of my practice I lived where there were no dental societies. I felt that professional seggregation was not good for myself; in fact not good for any person interested in their profession. My preceptor was keen on societies. He lost a great many good suppers that he might travel a hundred miles or so to attend the meeting. Now wisely we always have supper, and then the meeting; my preceptor is always on hand. He was raised on the farm, he is large, his hands are heavy, yet his work is always artistic, a master workman.

He had an associate who never attended meetings—"crowds too great," never read the dental literature, "Half these men don't know what they write about." He was of gentle birth and education. It was a pleasure to have his soft gentle hands touch your mouth. His work was a success; but where was the beauty? It lacked the artistic touches. He was not a master workman. He absorbed from the profession and had nothing to give in return. Every prosperous dentist should be a member of a society and an active member. If you are not prosperous join a society; perhaps you will prosper. We need you and we will help you. At this period, when dues are cheap, just think gentlemen only a dollar to belong to Northern Illinois, and then you need these two days from your office, you have a good time shaking hands and renewing acquaintances. Now on the Q. T., never mind about you and Jones attending the same college and Jones becoming more successful than you, just pluck that thorn out of your bosom. I am sure Jones never harbored anything against you and remember our Liberty, Equality and Fraternity. Offer your hand to Jones and if he smites you on the cheek turn the other cheek and let him smite it also. We will take a count and I am sure you will be surprised at the number of your friends. You have something up your sleeve, let go of it, give it to the society, and the society gives you something in return. The Northern Illinois Society covers twenty counties. With a vast area like this we should have a membership of 2,000 and we will have it some day, and you will rejoice. I cannot hope for this society to start an assurity fund protecting its members against lawlessness, intrigue and blackmail. That must be taken up by the National Society and I hope you all will lend your support to the National Society. Just write a word of encouragement to Dr. Warner of Urbana, Ill., and Dr. Otto King of Huntington, Indiana, and it will be gratefully received.

A year ago I met Dr. Roach in Chicago. I heard that he was confined in the hospital. Oh yes, he had been, but left the hospital to attend the Nebraska State meeting and now was back in Chicago, and "what a meeting, no where had there been such a meeting,—the enthusiasm. These men were up in dentistry." Now gentlemen we are going to convince Dr. Roach that we are enthusiastic. Put our shoulders to the wheel and work.

GOLD WORK.

For nearly a century dentists have been condensing gold into defective teeth. Perhaps more stress has been laid on gold filling than any other branch of dentistry. The conscientious student labored, sweated, lost his temper, spent sleepless nights and worried himself into a decline over his gold fillings. Whole libraries have been written upon gold restoratives, cavity preparations, etc. Patients have sat in chairs five and six hours, a continuous rat-a-tat-tat, on one tooth, arising from the chair with a rat-a-tat-tat headache and nervous condition which required weeks to overcome. Of course we had rapid workmen who would condense a book and a half of gold in a tooth in an hour. Thank God they do not live now. I deplore the passing of the condensed gold fillings. I see them from day to day in the old patients and they are beautiful, they have preserved the teeth, there is art in the contour; it required an artist to do this work.

INLAYS.

Thirty years ago a dentist called the assistance of his office boy to look for an inlay which he had completed that afternoon with the cement upon it and ready to insert in the cavity it slipped from his fingers. They looked in vain. That dentist was a genius. He could make instruments, he could originate, he was a wonder, he invented. The office boy was surprised to find the office lighted one morning at 5:30 and his employer hard at work on a vulcanizer. The boy was greeted with a smile. "Now I am going to show you the most wonderful machine going." He worked, worked and worked, uttered many expressive adjectives. Everything went wrong. At last he laid his head on the bench and sighed. "I must go home and get some sleep as I have a patient at 9 o'clock." *Think of it, gentlemen!* His suspension engine, run by water power, thirty years ago, the controller which did not always work was under the floor and frequently the rugs, carpet and floor were torn up to regulate the controller. Upon one of these occasions the office boy while restoring the floor, carpet and rugs discovered a nugget of gold covered with cement and asked the dentist if it was any good. Think of it, gentlemen, what would you have said, six months after you had made your first grand inlay? That man had spent a great many sleepless nights and absented himself from divine service on Sunday to perfect a machine which would bring about a revelation in dentistry. Wasn't it grand? Wasn't it noble?

Many decades ago a dentist sitting in the lobby of the Continental Hotel patiently waiting for a friend was attracted by the click, click of the telegraph instrument. The click, click ran riot in his brain, with the pound, pound of his hand mallet for condensing gold. He originated the idea that the same energy might be utilized in condensing gold. He immediately proceeded to perfect a machine that revolutionized gold filling. The dentists all over the world used this machine. It was almost impossible to practice the profession without it. No word of thanks or praise were ever given to the inventor; on the contrary he was abused and at a National Meeting in Buffalo he was heard to remark, "I am proud of my enemies." Will it happen that another will rise up in the meeting with the same words?

PYORRHEA.

A year or more ago a writer on medical and dental subjects for a popular local paper caused a great commotion among the subscribers of that paper by advocating a wonderful cure for pyorrhea. The results obtained were unbelievable, myriads of cases never known have been cured, patients have been raised from the grave with good sound teeth and gums. The price of the medicine soared up and up, the dentist bank account soared up and up. You who have given this treatment, have you noticed how many of your patients have returned time and again wishing to take a little more, just a little more treatment? "I feel I need it. I am sure my gums are not what they should be. I am depressed. My mouth does not feel clean." You who have taken the treatment yourselves, experienced the wonderful recuperating results, the sleepless nights followed by nights of sound sleep, the cardiac stimulation, and then as the results wear away, the languidness, the sleepless nights again, the depression of the cardiac, and in sympathy with your patients, you also want just a little more to give you "tone." Perhaps you are having an extra amount of work. Perhaps your social duties are taxing your strength. I warn you, our bodies are machines that will stand only a certain amount of work, then our magneto will be corroded, our engine may get too hot and explode the gasoline or sand in the gear box—in any case our machine is finished and it requires a lot of rebuilding with unsatisfactory results. In July one of our dental magazines published a fatality from over-treating pyorrhea. I warn you again, gentlemen, be cautious. Start nothing that will be injurious to yourselves, your patients, or profession.

NATIONAL RELIEF FUND.

A few years ago a National Relief Fund was started for indigent members of the profession. There is now about $12,000. The greater portion has been raised by the sale of Christmas seals. I know what some of you are thinking. I want you all to think good thoughts. It is not that you and I ever expect to get any relief, we want to stay away from it, but do want to help the poor unfortunate who does need relief, therefore when the Christmas seals are sent to you on December 10th just remit the dollar and order a dollar's worth more from the Secretary of the National Dental Association. Don't throw them to one side like letters and postal invitations, inviting you to participate in the program, but use them and take pleasure in using them.

I cannot close without digressing, and I think you will excuse me. At this time when all of Europe is in a turmoil, all the country around us unsettled, commerce unsettled, isn't it grand our government has been able to maintain peace in its domains? Some of you may say, "We should be in it, our country should stand up for its rights." How many of you have lived in a war district, have seen the firing of guns and the rattling of shells and as the smoke clears away have seen the horrible devastation, the dead, the dying? How many of you have had men full of life, health and strength come into your office saying "Examine my teeth, old chap, I am off for the front in the morning." You clean their teeth, restore a couple of defective ones and with a hearty handshake, "Good-bye old chap," he is gone—gone never to return. Perhaps he does return and wanders into your office again. He is changed, he has lost all the old snap and vim. He gives you a cold clammy hand to shake, a nervous wreck, "Just dropped in old chap to say hello." I tell you there are other ways to decide these questions than by war, and our government is using the correct way. Do not criticise, on the contrary help, help, if not with sinews and muscles with charitable words and loyalty. It has been my pleasure to see thirty-five war craft in the harbor at one time, representing many nations. I have visited and met the men on many. My heart is for my country. The officers are drawn from all classes. They represent the brains of our country rather than the wealth. It is a pleasure to meet these men. It is a pleasure to meet the man who joins the navy because he wishes to make it his vocation and because he can pass the physical examination. In our country there is no forced military service. Each man serves for love of country. Therefore they must be superior men and we must do everything we possibly can to protect these superior men who in turn are protecting us. As the first Tuesday after the first Monday in November is drawing near be conscientious, cast your ballot for the man you love rather than the party you belong to, be conscientious. Let us be broad and conscientious in all things. Let us forget that our patients have pocket-books, but think of the mouths, how best to beautify them, make them superior mouths in looks and comfort.

"By his unrivalled skill, by great
And veteran service to the state
By worth adored
He stood, in his high dignity
The proudest knight of chivalry."

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A REGULAR MEETING WAS HELD OCTOBER 17, 1916, WITH THE PRESIDENT, DR. GEORGE C. POUNDSTONE, IN THE CHAIR.

Dr. Truman W. Brophy read a paper entitled "Improved Technic in Palatal Operations," which was illustrated by numerous slides.

DISCUSSION.

DR. THOMAS L. GILMER:

Mr. President, Dr. Brophy, Ladies and Gentlemen: If there is any one who can speak with authority on this subject, it is the gentleman who has given the paper this evening. He has done more work, more good work, than all other men in this line put together. His name is probably more widely known than any other living dentist, and I think we should feel a great deal of pride that we have in our midst a man who is so widely and so favorably known and one who has done so much for humanity.

I do not know if you have had brought to you by a mother and father, perhaps married but a year, their first born afflicted with this terrible deformity. I do not know whether many of you have seen the picture I have just drawn, but to me it is most pitiable, and the man who can take such a child and transform it into presentable shape so that it can speak and go through life with its associates without humiliation, has rendered a great service, and the gratitude of parents of such children is most touching.

In the first part of his paper Dr. Brophy spoke of the poor conception dental students have of the duties of the dentist. That has been true in the past more than at present, still it is very prevalent yet. Those of us who are teaching in dental schools know what most interests the young man who comes to us for training are things purely mechanical. I am speaking now in the abstract; there are many exceptions to this rule, but as a rule, many of them care little for the important or fundamentals upon which a dental education should be based. This is equally true of the laity.

Here is an instance, some years ago a woman brought a young man to me and said, my son has tried this and that and has been a failure in every one, and, she further remarked, I am convinced that he is well adapted for the study of dentistry. This was a reasonably intelligent woman, though her conception of dentistry was, that it is something easily learned, which is far from what we know it to be. This idea is rapidly passing away. People are becoming educated. The knowledge that the laity now possess, that infections of the mouth and jaws are productive of many disorders of the body, has helped to broaden their conception of dentistry.

We must all admit that there is much that should be taught in the medical schools which is not taught, but the medical students are heavily loaded with other things which they must know. This is one reason why they cannot undertake more.

I agree with Dr. Brophy that palate and lip operations should be done early in life. It was Dr. Brophy who so strongly urged that early operation was desirable. To me, it is easier to do many of the palate operations later in life. I believe we succeed better in the soft palate operations and have fewer failures, if the operation is done after the patient is nine or ten years of age. But at these ages we do not do so much for the patient. If the operations are done later in life the patient has learned phonation in an imperfect way, and he has to re-educate himself in speech.

The surgeon should adopt some method of operation which he believes is best, then continue this method until his technique is perfected. In other words, it is very important one should develop a technique, and then follow that technique, rather than to be continually changing from one technique to another. Frankly, I am unable to do Dr. Brophy's operation, that is approximating the entire hard palate by forcing the two halves together, as successfully as he does. I have never seen any one who did this operation as well as it is done by its author. He does it better because he has done it over and over in his way. He has studied and practiced it so often that he has developed a technique which is perfect. This makes it possible for him to do that which others cannot do.

Several years ago I settled down to one method of operating, which is in some respects different from that done by Dr. Brophy. It may not be as good, but I succeed better with it. I do not attempt in my operations to bring the entire hard palate into apposition, at the same time. I bring the anterior portion of the bones together, and, at the same time close the lip. Dr. Brophy prefers to leave the lip open, since it gives more room to operate on the soft parts later. I get a better nose if I do the lip at the same time I close the anterior portion of the jaw. Later, before the child learns to speak, I close the soft palate and the posterior part of the hard palate. I get good results, and that is what we all aim at. There is no surgical operation more difficult than palate operations, and it is very gratifying that we succeed as well as we do.

The mortality, as Dr. Brophy has said, is light. When I began this work I learned from the text books that we should expect a mortality of twenty-five percent following palate operations. Dr. Brophy's experience shows that twenty-five percent is far too great, and the experience of Dr. Moorehead, myself and others bears this out. The percentage of deaths from operating on these cases is comparatively low and when death occurs, it is generally due to the physical condition of the patient.

Dr. Frederick B. Moorehead:

This gathering is a splendid tribute to Dr. Brophy. When I saw the title of his paper, I wondered how many general practitioners would come out to the meeting. Certainly it is not that most of you are particularly interested in the surgery of the palate and lip that has induced you to come here tonight, but because of your appreciation of Dr. Brophy personally.

A man who is not doing cleft palate and hare-lip surgery, necessarily has no particular interest in the work.

There are two or three things I would like to speak about briefly, and these deal with the questions that I feel are more important to you than the technique of cleft palate surgery, matters which Dr. Brophy has discussed in his paper.

He began his paper with an indictment of medical and dental education, stating that both are deficient in certain particulars. This is perfectly true, but I imagine the men engaged in dental education, for the most part, are doing the best that they can considering their limitations, in the matter of formulating a curriculum which will include all the necessary subjects, and even some of the more or less special subjects; and I imagine also that the men who are responsible for the curriculum in medical education are doing the same thing.

Some of those who are responsible for dental education, have commercial limitations, and are necessarily handicapped in their plans. Just so long as dental education is kept on a commercial basis just so long will the curriculum be circumscribed.

The endowed institution or university may have more freedom of the palate operations later in life. I believe we succeed btter in

Dr. Brophy has stated that in our medical colleges not much attention is being paid to oral pathology. I think that it is perfectly true that medical education today is deficient in the attention given to the pathology of the mouth. There is a similar deficiency in dental education with reference to the training of the student in the matter of general medical intelligence. We have men in dentistry today who maintain that dentistry is a Simon pure mechanical proposition; that above everything else one must be a technician. When technical training is paramount in its place on the curriculum, it is clearly evident that the student is not going to get very much of a scientific perspective. Such a man placed out in the field of general practice is necessarily limited in his activities and usefulness. He will do the thing that Dr. Brophy complained about—make mistakes in diagnosis. His high degree of skill as a technician will not save him when it comes to the interpretation of pathology. While in the medical curriculum scant time and attention are given to oral pathology, it is perfectly true that in the dental curriculum scant time and attention are given to those basic things that are going to make well-rounded, well trained individuals. The one is quite as true as the other. How shall we improve our dental curriculum so that it may include the things he is obliged to do mechanically, and at the same time make him sufficiently intelligent in the broad field of medicine that he will not make serious mistakes in the interpretation of lesions which may need attention.

One of the saddest things one meets in a special line of work is seeing every year a large number of cases beyond hope of recovery, inoperable cases, because such cases have been in the hands of men who are only partly educated. A little learning is always dangerous. Given the dental student with only a mechanical technic, place him in general practice; make him legally responsible for what he does, and then expect him to interpret pathological lesions with a limited training in the subject, and you invite failure. If such a man be broad minded he will ask for counsel when he gets into a tight place and thus save his patient from harm. If, however, he be of another type he will likely not seek help, but will keep such a patient under his observation and care until it is too late for anybody to bring about a satisfactory issue.

How to prepare the practitioner of dentistry so that he shall be a good technician and at the same time give him the proper training to interpret pathological lesions is not a small undertaking. The general practitioner, whether he be in medicine or dentistry should in the first place be competent to render expert service in his particular field, and at the same time be sufficiently intelligent in all those correlations which reflect themselves in his particular field to safeguard his patient from danger. If he can do that, certainly nothing more can be expected of him. The human body is too big a subject for any one individual to master. I imagine in the near future medical education will pay much more attention to the question of oral pathology because of the work in recent years in chronic infections. I think that medical education realizes today the fact that there is a large unexplored field of medical education that must receive more attention, and I am satisfied that our medical colleges will do better work in this particular than they have in the past.

The whole question of diagnosis is a big one. To be a good diagnostician a man must be possessed of a well grounded, thorough-going training in medical sciences. Any man trained alone in a particular phase of medicine is necessarily limited in his vision. Again, a student is likely to reflect the type and character of his teachers.

If in the dental school a student has broad-minded, well trained teachers, he is apt to become more or less broad-minded himself. If a student has emphasis placed only on prosthetic and operative dentistry he is apt to emphasize those subjects to the exclusion of everything else in his practice. We must have in our dental colleges men of well rounded training, men of scholarship, whose principal interest is in teaching. The time must soon pass when a man may drop his work in his office, put on his coat and hat, catch a street car, rush into a dental college, teach for an hour and then rush off again. No man can serve two masters; he cannot have divided interests, and if he is giving his whole time and strength to practice he cannot serve the student as a teacher. We must have more full time men, men adequately trained, whose chief concern will be that of teaching. To do this requires money, and only the university and endowed institution can afford it.

Dr. Brophy intimated that the dollar sign was a student's slogan. One of the most pathetic things one meets in dentistry in an administrative capacity is the attitude of the practitioner toward teaching. If you put up to a man the question of giving some time to dental education, the first question he asks is "how much will you pay me; how much money can I get out of the college?" As a matter of fact, money has but a small place in the life of a scientist; the man who is looking for an opportunity to grow, and to contribute something to his profession is not chiefly concerned with the question of dollars and cents. The man who is imbued with a scientific spirit is not going to ask, first, how much money he is going to receive for the time he may give. All the right kind of a man wants is an adequate opportunity. Such a man will make his place and is likely in the end to make his dollars too.

I think there is a healthy evolution in both dental and medical education, and the day will soon arrive when dental education will be placed on a high university plane.

We may criticise the work of yesterday, both in medical and dental education, but I think we should be more concerned about leaving to our children as great a heritage in this particular as we have received from our fathers.

I do not believe that Dr. Brophy believes in teaching technical palate surgery to dental students. One may show a few cases, and perhaps operate on a few palates, but for the purposes of the general practitioner, extensive training in palate surgery would be a distinct loss. There are so many other more important subjects, the student should not spend any particular time in the surgery of the palate or harelip. But this work must be done, and requires a special training to do it; there is no question about that. The general surgeon usually does poor special surgery. A man may do brilliant abdominal surgery, and surgery of the extremities, and yet do exceedingly poor work in special surgery. We need specially prepared men who shall serve the mouth in the same capacity and quite as efficient as men who serve the ear and the eye.

After all, the serious question is—can the general dentist ever hope to do all that is required of him in the reconstruction of lost tissues in the mouth, and at the same time be trained to treat the pathological lesions of the mouth? Can a man become a skilled technician in the handling of metals, and at the same time a highly trained technician in oral pathology and surgery? I think not. Neither can the medical man. It seems to me there is need of the man who is going to have a broad type of training, and who shall devote himself specifically to the medical aspects of mouth work.

I might take some time in talking to you about Dr. Brophy and cleft palate surgery, but I am not going to. I think every man who has done cleft palate surgery owes Dr. Brophy a gratitude for the contribution he has made to the subject.

I had the privilege of being associated with Dr. Brophy, first as a student assistant and then as a graduate assistant, and I am in a position to appreciate more than some others some of the things Dr. Brophy has accomplished. He has had a long, hard fight in this matter of early operations in cleft palate surgery. He is entitled to great credit for having taken a sensible and conscientious position, and sticking to it until the great majority of surgeons the country over have come to his way of thinking.

After all, there is only one reasonable time to close a cleft palate, and that is just as early as the general condition of the infant will permit. The time to operate cannot be reduced to the question of weeks or months, but should be done as early as the general physical well being of the patient will permit.

Dr. Brophy in his paper did not emphasize one of the very important questions in this whole matter of surgery of the palate and lip, and that is the question of the nose itself. It is rare that one sees a good nose following a hare-lip operation. Usually the nostril on the affected side is low and flat. In the ordinary type of harelip there is no occasion for such conditions to exist because one may form a good nostril and secure a well proportioned nose. Another very important feature of this matter is the length of the palate. We have all closed cleft palates that have been congenitally short, and in such cases have secured perfect anatomical results; physiological results, however, have not been satisfactory.

The technique of Dr. Brophy as suggested, is an excellent one to lengthen the palate, and one may really make a palate as long as may be necessary to close off the vault of the pharynx. Any man who makes a definite, well rounded contribution which goes to the improvement of his race, must be looked upon as a benefactor, and certainly Dr. Brophy in his cleft palate surgery has made such a worthy contribution and deserves a lasting place in the world of surgery.

DR. WILLIAM H. G. LOGAN:

It is now 10 o'clock and I will not detain you long. I will say this in relation to what should be expected of a dentist since that question has been brought before us. The dentist must know more of general medicine. I believe it is important that he should know more of general medicine than he should know of technic of the surgery of the mouth. Unless he gives all his time to the surgery of the mouth, he will not be a success. It cannot be otherwise. There are too many difficult problems in dentistry for him to go far beyond the real problems of dentistry. The problems in dentistry have materially increased in the last five years, and in the next five years they will undoubtedly increase more. Speaking of solving tthe problem of how the dentist is going to be more successful, he will be a broader man than the average practitioner in the office. Therefore I would not try to teach the technic of surgery to dentists, but the dentists should have a knowledge of the diseases that begin with the structures about the teeth, and spread from them. He should be taught the pathology of these diseases and their diagnoses, and then, as Dr. Moorehead has pointed out, he should know enough to know what he does not know. If we can teach him that, he will then call for help if it is needed. He will then give better service to his patients than he has done in the past.

Now, in reference to the question of cleft palate operations. Is it strange that Dr. Brophy is the peer of all men in the field in cleft palate work. It was thirty years ago this year that he did the first operation of bringing the bones together. If you do something many times a week for thirty years, and that is your consuming thought, and you have a surgical technic and a surgical training that allows you to develop, why should you not reach the desired end? There never has been until this time through all the history of surgery a man who has had the percentage of success that he has had. He has been consumed with one single thing. It has been cleft palate with him. You go and view twenty patients in a hospital in a single day with him, either cleft palate or hare lip, all the same general deformity, and there will be probably fifteen of that number that require operation. As long as surgical records are written, Dr. Brophy's name will go down in history as one of the great masters of the surgery of the palate.

You gentlemen did not come here with the expectation of learning much about surgery of the palate; you came because of the greatness of the man, and that is the reason we are all here. No man that I know of, and I have seen a good deal of the cleft palate work done by the surgeons of this country, has ever achieved the same results that Dr. Brophy has obtained. He has obtained his results because he has developed one plan and has followed one technic. As Dr. Gilmer has pointed out, if you have a technic with which you obtain reasonable success, stay with that technic in surgery or in dentistry, as the case may be.

It has been a pleasure to all of us to have been here this evening to honor this man, and I say to you general practitioners of dentistry, go home and tomorrow try to do things dental better than you have done them before, and let the other men who are trying to do special things go on with their work; encourage them by appreciating their work as you have done tonight, so that when they come before you you can give them your attention.

Dr. Brophy (closing):

I would be extremely ungrateful to those who have spoken and to this audience if I were not to say that their remarks have touched me deeply. What I have done in this particular line of work has been done through the stimulus of those about me. How well I remember when I did my first operation and the circumstances under which it was done. I did not take the patient and go into the operating room and close the doors lest I might not succeed, but I operated before the class of students. Of course, I had carefully studied the methods that I expected to employ, and I had made careful dissections on infant cadavers. So when I began that operation I was not embarrassed for the want of a knowledge of the anatomy of the parts. But I realized how hazardous it was to undertake to do anything which, in the event of failure; would have been adversely criticized by all surgeons, and would have been declared a surgical procedure without any well defined precedent. But I was fortunate in that my patient recovered.

I particularly wish in this public way to express to Dr. Gilmer my grateful thanks for his beautiful tribute and his kind expressions of opinion regarding my work.

As I look around me I miss the faces of many of my old friends. As I think of the history of this society when I first entered its sessions, those who were active in its work are not here now. Only a few (I can count them on the fingers of one hand). Dr. Gilmer and I have lived together and worked together, following the same paths, meeting the same conditions, perplexed by the same problems, through all these years have been warm friends, close to each other in all of our relations. I say this while we are both here and living. I realize that in the natural order of things only a few years shall pass until we shall have joined those who have gone beyond. My friend, Dr. Vincenzo Guerini, stated in a letter to me at the time that this society so generously gave me a magnificent banquet, at which time he presented me a bust of Dr. Chapin A. Harris, founder of the first dental college, "In presenting you with this bust, I salute you. May you live as long as is consistent with the laws of nature."

You may think I am digressing from the topic of this paper, and I am, but I think I have a right to do so. I will not trespass upon your time when I say, the manner in which my paper has been received has almost overwhelmed me. When I read this paper after it was typewritten I thought it would be a failure; I did not have the time to put on it the work that I would like to have done in order to present it to a society like this, but I did my best in the hurry of my work. To those who have discussed it so ably and so well, who have been so generous in their expressions of approval, I wish to apologize for not having forwarded to each of them a copy of it. There was no copy until this afternoon. I told my secretary to get out a synopsis of it and send it to these gentlemen because they were entitled to the paper, that they might know something about what I was going to say. She did her best and she gave them something.

To Dr. Gilmer, Dr. Moorehead and Dr. Logan, who have discussed my paper, I wish to express my sincere thanks. I do not think I have done anything here tonight that is unusual or out of the ordinary. I have often said that if I could not do this work fairly well, doing it every day, and sometimes three or four times a day, there would be something wrong with me.

There is only one other thing I wish to say regarding the discussion tonight, and that is regarding teaching. There must be a change. There must be an improvement. The dental student must know pathology. We have evidence all the time that there has been a lack of knowledge of pathology on the part of students and dentists in the past. Is it not in part due to the failure of our dental colleges to present it in the proper way? I think it is. Is it not due to the fact that the dentists who send students to college have not impressed those students with the importance of knowing these ordinary things?

This has been my clinic day. A student brought a patient into my clinic today who had with him some X-ray pictures, roentgen photographs or skiagraphs. I asked the students to make a diagnosis or to interpret these pictures. The students came down and looked at them. There was a tooth root in one, the apex of the root. There was a darkened area about the end of the root. One student said the patient had necrosis, and another student confirmed it. Finally after passing the skiagraph around among the students I told them it was an error. There was not necrosis of the bone. Long ago I made up my mind that a darkened area around a tooth root was not positive evidence of disease, any more than a line through a fractured bone appearing in a skiagraph was evidence of a fracture. It may be evidence that there was a fracture. The bone has healed, it has united, but the new formed bone at the line of union does not show in the plate that same degree of opacity that is shown in the original bone. If that area appears around the tooth root long after disease has vanished, too frequently the observer declares, here is disease, let us have the tooth or teeth out. These things are not right.

While it is a fact that there has been a great lack of proper training in the schools of dentistry regarding general pathology, and in some instances special pathology, there is a lack of knowledge among medical men and medical students regarding dental pathology. Too frequently today teeth are condemned by reason of the fact that a darkened area appears around the end of a root within which there is not a trace of pathogenic miscroorganisms. This fact has been demonstrated time and again. Better teaching must be done in the schools of medicine and students will learn how to make diagnosis of diseases of the teeth, the most common diseases known to mankind. A study of biology, bacteriology and botany, and the like, is very good. We approve of it, but the medical man must know how to attend to his own business, how to meet disease, how to recognize it, and how it should be treated. If a case comes within the border line of medicine or dentistry, outside of his sphere, he should know enough to know where he can send his patient that he may be properly treated. As. Dr. Moorehead has pointed out, there are two sides to this question, but the curriculum must be improved, so that there will be improvement in methods for the benefit of those who suffer.

I have brought here tonight a young man who has been under my care. Lengthening of the palate to restore speech is not a theory. It is not based upon assumption. It is a fact. Facts may be proclaimed in words, but far better is it that they should be seen, proven and the observer convinced.

If you will permit me, I will ask Dr. Gilmer to look into the mouth of this young man who has consented to remain here for a while. His home is in Mississippi, and he presents himself tonight so that I may show you what has been done for him. When he came to me his palate was too short. One gentleman suggested splitting it open and putting in an artificial velum in order that he might speak better. One side of his lip was down and the other side was up. He had the kind of nostril Dr. Moorehad has described; his nose was crooked, and nostril flattened. You will hear him speak. This case shows what can be done in the reconstruction of the lip and nose and in lengthening the palate.

CHICAGO DENTAL SOCIETY—WEST SIDE BRANCH.

DISCUSSION OF THE PAPER BY DR. L. SCHULTZ, ON "THE RELATION OF THE ROOT CANAL TO FOCAL INFECTION."

R. J. CRUISE:

First, I want to thank Dr. Schultz for the splendid paper which he has presented here tonight; it lays before us in a concise form a situation which has arisen in the practice of our profession which must be regarded in some ways as a blessing, and in some ways as a disaster.

There is no room for criticism of Dr. Schultz's paper, because the truth is beyond criticism, the important thing seems to be to face the situation, and overcome it, and when the human heart is endowed with a determination to overcome a difficulty it generally does so. Therefore I feel that the dental profession has already made great progress in this particular line, and before long we shall have accomplished a great deal more.

Surely it is a blessing even at this late hour, after millions of teeth have been treated, and millions of root canals have been filled only to be a cause of evil, that scientific research should have discovered that it lies in the power of the careful dentist to prevent in suffering humanity, many of the ills to which it has fallen victim in the past, and we cannot take lightly this new responsibility placed upon our shoulders.

To explain the statement that the situation must be regarded in some ways as a disaster I must for a moment become retrospective.

It was only a few years ago that it used to be we could fill root canals, feeling assured that we had performed a perfect operation, and satisfied that there could be no further trouble. Today the conscientious dentist fills a root canal with fear and trembling, conscious of the fact that despite his extra added care and improved technic, he may still be leaving in the periapical region the seeds of future trouble, and no man is brave enough today to say, when he has treated and filled the roots of a tooth, which have been pathologically involved, he has in his operation removed the possibility of all future disurbance, local or systemic. This I consider nothing short of a disaster.

However times have changed in many things besides dentistry, and that I may emphasize and prove this fact, I will take the liberty of injecting into the discussion an incident of travel, which emphasized it to me during a recent vacation, and then draw a comparison.

When returning from my vacation at Mackinac Island this year I came down on the Manitou, which makes one or two stops on the trip, the last being at Charlevoix. There a number of passengers got on board, and from amongst them one in particular caught my eye.

He was a little gentleman of unquestionable Hibernian origin, an upper lip of about two inches, a small tip-tilted nose, and his clean shaven face adorned with a very trim set of Galways. He was spick and span, with a new suit of light grey, a white tie, and shoes, which spoke more for comfort than style. In fact he belonged to that type, to look at which is to be amused, and I thoroughly enjoyed him. A little later on in the afternoon he took his seat on the upper deck, and there acted as a self-appointed censor on the various travelers who passed by him, sizing them up from head to foot, and at times talking to himself in a whisper, presumably as he passed judgment on them.

About six o'clock the welcome signal for dinner was heard, and I responded quite promptly. I was alone, as I had left my friends up at Mackinac to return to Chicago, and start out on a fishing trip.

I was placed at a table in the middle of the dining saloon at which there was room for six, and already four seats had been allotted to some ultra fashionables from Boston who were congratulating themselves as I sat down that they would not be marooned in horrible Chicago, now that the railroad strike had been called off.

I gave my order, and was doing a little observation work on the Bostonians, when my little Irish friend appeared at the door.

He looked hungry, possibly a trifle embarrassed. The head waiter went right up to him, and said "One, Sir." The response being in the affirmative the waiter, with rare discretion, brought him over and placed him at my right.

He was handed the large double menu card, and with it the slip on which to write his order. He picked up the latter, and then dived into his pocket from which emerged a large spectacle case, out of which he took a pair of glasses with cast iron frames, and placed them on the end of his nose.

He looked at the order blank, front and back, and then laid it down on the table, saying in an undertone "There's nothing on it."

He then took up the menu card, read it up and down and then down and up, picked up the order blank, and with a kind of disgusted look placed it inside the menu card and laid them down on the table in front of him. Presently the waiter appeared and approaching him he said, quickly, "Have you written your order sir?" My little friend picked up the menu card and holding it up to his face in an apparent effort to conceal his speech, but loud enough for me to hear, said, "Bring me an orther of ham and eggs and a cup of coffee."

Already it was quite an effort for me to conceal my amusement, so I only looked at him through the corner of my eye, but I could see that he had something to say, and was debating with himself whether he would address the Bostonians or myself. Finally after a little uneasiness in his chair he turned to me, as probably the most appreciative, and removed the following diagnosis of the case from his system: "Well, I've been thraveling up and down them lakes for thirty years or more, it used to be you could get a square meal for the asking for it and the paying for it, moderate; but now with their fan dangle notions, you got to write for it, pay three times for it, and thin get nothing."

If I may be permitted to draw a comparison, I would say, it used to be that we could easily fill a root canal for being asked to do it, and being paid for it moderate; but now with the fan dangle notions of the present day, we have got to photograph it, we have got to charge three times for it and then we don't know if we have done anything worth while.

But to return to the serious aspect of the subject, may I emphasize Dr. Schultz's advice to eliminate Gates Glidden drills, broaches, wires, cotton and Oxypara from the category of root canal fillings, not that I think or I am sure Dr. Schultz either infers that the members of this society use them. The rubber dam should be used always in treating teeth, and if you want to know why saliva should be excluded from all teeth during treatment, ask Dr. Schultz himself.

Dr. Schultz tells us that a very small, nay an invisible focus may be the cause of very serious mischief, as its potentiality for trouble depends on the resistive power of the patient, and the virulence of the poison.

This is a very important consideration as all individuals are subject at one time or another to the lowering of their resistance from other causes, when these invisible foci may turn the tide in favor of death instead of life, or life with permanent disability and suffering instead of recovery.

The findings of Dr. W. H. G. Logan in his comprehensive and detailed study of this subject should be followed by all of us who are now so interested in its importance. I refer particuarly to his undertaking to ascertain the usual blood findings in consecutive cases of chronic oral infection to determine if valuable information could be collected which would be of benefit in reaching a decision that chronic oral infection, though producing little or no discomfort was in reality sufficiently active to produce characteristic blood changes which would be of diagnostic aid in deciding in favor of treating the infected foci with retention of the teeth or demanding extraction and curretment of the area.

In the light of the knowledge which has come to us on this subject in general, it is not sufficient for us to stop at efforts to improve our technic, and detail in the treatment and filling of roots, we must try to grasp the whole situation from its broadest viewpoint, and only such action on the part of the dental profession will put us in the proper standing with brothers in the medical fraternity.

Until we are able to intelligently dictate along these lines perhaps we cannot be so harsh with some of the members of the medical profession who are insisting on the wholesale extraction of teeth.

A word on the question of radiographs, some of them are about as interesting and intelligible as Jupiter through a telescope, or the Northern Lights at Mackinac. They are sometimes deceptive and untruthful.

Therefore I would say with Dr. Schultz that we must make a careful study of this subject if it is to be of real use to us in diagnosis, and consult freely with competent radiographers, when in doubt.

In conclusion let me say that nothing comes nearer to my idea of the remedy for a serious situation into which we have been precipitated, than Dr. Schultz's summing up of what we shall do in order to live up to the highest ideals of present day dentistry.

Prophylaxis. Prevention, and What Does It Mean. Does it mean the old style cleaning of teeth in twenty minutes or half an hour? Absolutely not. It means the cleaning of every tooth with the greatest attention to detail. Cleaning and polishing teeth with a system. Scaling them with instruments suited to the work in the use of which skill has been acquired. Each tooth taking more time than we used to give to the entire set.

For fifty years the colleges have taught that "A clean tooth will not decay." But they have never taught, and don't teach today, how to clean teeth.

Of course for many a long day teeth will have to be treated, and root canals will have to be filled, but the aim of present day dentistry should be to avoid the necessity for these operations in generations to come.

All great and radical movements in every line of endeavor have usually been heralded as jokes or impossibilities.

When Marconi sent his first wireless message from Athlone to Tullamore, King's County, Ireland (for some of you may not know that his wife was an Irish colleen born in Athlone) the world laughed at its announcement and said he had wires underground.

Where would we be today without wireless telegraphy?

So I do not consider it at all outside of the bounds of possibility as I consider it quite within the realm of necessity that the whole status of our professional practice undergo a change which must and can only be accomplished very gradually.

We are on the way to it now. Look at the movements already on foot, giving license to the dental nurse to perform certain prophylactic operations, that alone is going to save thousands of teeth from the necessity for treatment and filling, and gradually the profession will wake up to the importance, practicality, and necessity of it all.

The change will come about slowly but surely.

I am not a dreamer, but disposed by nature to be intensely practical, but I prophesy that those of your grandchildren and great grandchildren who follow your footsteps in the practice of your honorable profession will not be as often photographing the roots of teeth they have failed to fill, as they will be glorying in the perfection of the teeth they have saved from destruction.

NORTHERN ILLINOIS DENTAL SOCIETY.

TWENTY-NINTH ANNUAL MEETING, HELD AT AURORA, ILLINOIS, OCT. 18-19, 1916.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

Dr. W. C. McWethy, Dixon:

Our President and His Address—How glad we are to be welcomed by him as president of this society. Surely no one is better fitted than he to speak of the value of a smile. He who for a number of years as secretary greeted us with a smile, distinctively Bowers, and one that did not rub off from one meeting to the next.

In a family prone to a sour disposition the first thing in the morning the following episode took place. Addie the one exception in the family was a typical Martha. Always waiting on the others and getting an extra breakfast for a belated indulgent member, remarked one morning to her brother, "Why George, is that a cold sore on your lip?" He with the usual family wit and also the regular morning grouch replied, "It wouldn't be a bunion would it?" This little anecdote heard by a member of another family who was inclined to the sunny side of life soon became a family by-word and the source of many a good laugh. There is surely no place in the world where a smile is put to better use than when worn by a dentist.

"Deplore the passing of the gold filling." Do you really think, Mr. President and fellow members, that the gold filling is passing? The porcelain inlay and enamel filling are its only competitors. The porcelain for various reasons has largely dropped into disuse. The enamel, a very unstable article on account of its uncertainties and dependence upon atmosphere, mixture, and many other things becomes a very poor substitute for porcelain. It seems safe to say that the student or practitioner who is not making every effort to improve his gold work whether foil or cast, is neglecting a most important part of his profession. And the gold filling will still stand as a leader in permanent fillings when those assembled in this meeting have returned to dust.

Yes, too often the inventive genius goes unremunerated and forgotten, for on every hand and in every walk of life we use and enjoy the product of such minds. The statesman can be made but the genius never. He must be born. He should be held in just such esteem by his fellows as he holds himself. He who respects not his God-given gifts has not the right to expect others to respect them though they be ever so valuable.

Using medicinal remedies that we do not understand. This thought was presented for your consideration one year ago. Dr. Bowers has brought it to us again at this time. I believe it should be kept before us until every practitioner, every dental college and dental student with one accord will say, "Get thee behind me Satan," to every medicinal agent presented to them until they have a full and complete knowledge of its contents and effects.

Dr. Bowers: (Closing the discussion.)

During the six years I acted as Secretary of this society it has been my pleasure to collect and save the proceedings since 1900. It has been interesting to collect them. It has been interesting to read them. Many times the presidents have appealed to me for assistance when writing their addresses. I have always sent them these booklets, therefore they have been useful. I have longed for the office you honored me with, knowing that I could take my address from these booklets. The fruit of the brains of our past presidents—who dares deny they are rich and luscious? Like Francis Wilson, with my "eagle eye and massive brain" I began my perusal of these booklets to get something new that would interest you people. I have worked and toiled early and late, exhausted my patience and again like Francis Wilson with my "eigle-hic-i and brainy-hic-mass" didn't find a new idea. There is not a new thought in all of these old things.

The Northern Illinois Dental Society held its 28th annual meeting at Odd Fellows Temple, Freeport, Ill., Oct. 20-21, 1915. This was also the 80th anniversary of the founding of Freeport. The event was made memorable by an historical pageant. My father, James LaFayette Bowers, was one of the oldest living residenters. having come to Freeport in 1840. At this time he is 93 years old. These covers are made from his old pig skin trunk which he brought from Center County, Pennsylvania, and now the product of the brains of his son, together with those of the past sixteen presidents, repose between his pig-skins. It gives me pleasure to present these to this society.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

DENTAL WEEK IN CHICAGO.

A noteworthy event took place in Chicago during the week beginning December 4th, 1916. The Mayor, Hon. William Hale Thompson, issued a proclamation appointing that week for a propaganda emphasizing the need of caring for children's teeth. This was conducted under the auspices of the Department of Health with the able leadership of the Commissioner of Health, Dr. John Dill Robertson. The Superintendent of Schools, Mr. John D. Shoop, also entered heartily into the movement, as evidenced by the following letter of instruction issued by him to his Principals and Teachers:

BOARD OF EDUCATION, CITY OF CHICAGO,
OFFICE OF THE SUPERINTENDENT OF SCHOOLS,
November 27, 1916.

To Principals and Teachers:

The following communication relating to the health of our school children, and especially to that which pertains to the care of the teeth of children, has been prepared by Hon. William Hale Thompson, mayor of our city. Special attention is directed to the proclamation of the mayor in which the week beginning December 4 is set apart as "First Dental Week." Principals and teachers are requested to interest themselves in making this campaign one that will be of valuable service to all of the children needing such attention. Will you not render the full measure of assistance to the inspectors who wait upon you with the purpose in view of making this campaign of child protection effective?

Sincerely yours,
JOHN D. SHOOP,
Superintendent of Schools.

MAYOR'S PROCLAMATION.

The great essentials in the building of nations or municipalities are the physical and mental development of children. I am a firm believer in the axiom "Children should be educated one hundred years before they are born."

My experience as a cow-boy on the western ranges of this country taught me that a boy and a girl must have enough of room and they must be healthy in order to develop. When, after having spent nine years in the great west, I returned to Chicago, I could not help but compare the lack of opportunities of the children of our city with those of the children I had watched out on the western prairies. When I saw little tots whose only play rooms were the filthy alleys of our city, I made up my mind that, if possible, I would do something to remedy conditions, and when, sixteen years ago I was elected alderman representing the Second ward, which was then as it is now, thickly populated, my first official act was to introduce an ordinance creating the first play-ground for the children of the city of Chicago, at an expense to the people of $1,200. The ordinance was carried and the playground was established at Twenty-fourth street and Wabash avenue, and I am glad to say it has been the recreation spot for tens of thousands of children of the south side, and proved the beginning of a wonderful system of playgrounds and recreation parks which has since been copied by nearly every large city in the world.

I find, however, after a great deal of study that a still greater problem confronts the people of our great city, namely, the physical care of their children. The Health Department of the City of Chicago has done a great deal to remedy some of the conditions that exist. This department has a large number of physicians, inspectors, and public-spirited men and women who are co-operating in trying to give the best care possible to all of the children and particularly those who attend the public schools.

No child will grow into perfect manhood or womanhood if physically defective. Very little attention has been paid to the teeth of children. Food cannot be properly masticated without good teeth, and a man cannot keep well and strong who cannot chew his food. If this is true of the man, it is equally true of the child, and even more important to children because the child eventually becomes the man.

It is deplorable that in a city like Chicago, with all its resources, with all its great dental institutions, and its famous clinics there should be any child doomed to go about with defective and diseased teeth, in which are lodged disease germs of various kinds which offer a constant menace to health and life.

I learn through the Commissioner of Health and his department that sixty per cent of the pupils in the schools examined last year had advanced defects of the teeth which needed immediate attention from a dentist. There are over one-half million children attending the public and parochial schools, which means that over three hundred thousand of these children have defective teeth. It is well known to medical men and others that many of the acute infectious diseases are caused by germs from defective teeth. Cavities in teeth filled with food become ideal places for the growth and multiplication of deadly germs. Diseased teeth can readily furnish material for the destruction of their owner. The early attention of a dentist can make them a source of health and happiness.

In the interest of the school children of today, in the interest of the men and women of tomorrow, in the interest of the health and happiness of all the people of our city, I, as Mayor, call upon the people who believe in the upbuilding and the future greatness of Chicago, to co-operate with the mayor and the health department in a campaign to bring about an amelioration of present conditions and to secure for our school children and all other children perfect teeth.

In our country today we have a great agricultural department which assists the farmers in cultivating and developing cattle, plants, seeds, fruits and vegetables. We have a department for the development of commerce and industries. We have a department for the conservation of national resources, but we have nowhere, in either the nation or in the city, a department devoted to the physical development of our children.

Let us begin in Chicago by devoting the week commencing December 4, to the slogan of "Give our boys and girls a fair chance." That week will be known as "Dental Week." During that week I urge upon the parents and guardians to have the teeth of their children examined by their family dentist, to have such treatment as is found advisable begun at once.

The Commissioner of Health informs me there are twelve dentists working in the public schools, paid by appropriation from the Health Department budget. These dentists are doing all that is possible, but the task is so stupendous that it will tax all the dental resources of the city. I have received the assurance of the Chicago Dental Society, the Dean of the Chicago Dental College, Northwestern University Dental College, and Illinois State University Dental College that they will set aside this week for the care of children's teeth.

I suggest that this be followed by a second dental week, which will be the period from December 23 to January 2, (the holiday week); that the preliminary examination and treatment be given during the first dental week, beginning December 4, and that the work be completed during the holiday week. This week is suggested so that children may not be kept from their classes in school any more than is necessary.

On the recommendation of Dr. John Dill Robertson, the commissioner of health, I have this day appointed the following advisory council to cooperate with him in the conduct of this campaign:

Miss Jane Addams, Dr. Arthur D. Black, Mrs. J. T. Bowen, Dr. Truman W. Brophy, Mrs. Helen W. Cooley, Dr. D. M. Gallie, Dr. P. B. D. Idler, Dr. C. N. Johnson, Dr. J. F. Keefe, Mr. Eugene T. Lies, Mr. Jacob M. Loeb, president board of education, Dr. W. H. G. Logan, Miss Minnie Low, Dr. F. B. Moorehead, Bishop Geo. W. Mundelein, Mr. J. J. O'Connor, Dr. A. A. O'Neill, Dr. G. C. Poundstone, Mr. John D. Shoop, superintendent of schools, Mrs Hannah Solomon, Rev. John Timothy Stone, Mrs. Francis E. Thornton, Mr. Harold F. White.

William Hale Thompson,
Mayor of Chicago.

The *Bulletin* of the Department of Health in its issue following "Dental Week" published the accompanying statement:

Chicago has just held its First Dental Week. It was conducted under the auspices of the Department of Health and in accordance with a proclamation issued by the Mayor, setting December 4th to 11th for its observance.

The object of this Dental Week was to concentrate or arouse public attention on matters pertaining to the care of teeth, its importance and effect on the health of the individual.

The Division of Child Hygiene in its inspection of school children finds that approximately 300,000 school children have defects of their teeth and need care. The reports of the dentists in the employ of the city show that much of the dental effects are due to neglect of the children's teeth. This may be due to ignorance, or indifference. This was another incentive for the establishment of Dental Week.

The Division of Child Hygiene in its school inspection of pupils also found that there were a large number of children whose parents were unable to afford the primary requirements for the prophylactic care of teeth, that is, the tooth brushes and paste. It is hoped, with the interest stimulated by calling the attention of the public in general to matters of teeth, and also calling their attention to the large number of children whose parents have no means to assist them, that the public would contribute so that the needs of these poor children might be fulfilled.

The program for the week was as follows: Monday, December 4th, the noon day rally was conducted to inaugurate Dental Week, at which notable dental authorities spoke. Lectures were given to pupils in the schools. Articles were published in the daily papers each day covering the educational phase of dental hygiene, these being contributed by leading men in the dental profession of this city. Moving pictures were taken of tooth brush drills, for the purpose of teaching the public the proper way to clean teeth. Tooth brushes and paste were distributed, as far as the supply permitted, to children who could not afford to purchase them.

The dental schools of the city set aside the week for the examination of the dental conditions of children brought to them, and the dental clinics conducted by the city also gave over the week to the inspection of children's teeth. It is hoped that this will be productive of good results for the future.

The Mayor is also planning an athletic entertainment to be given in the near future at the Coliseum, the proceeds of which will be devoted to the purchasing of tooth brushes and dentifrices for children whose parents are unable to supply them with these important adjuncts of health and cleanliness.

It will thus be seen that the city authorities of Chicago are fully alive to the best interests of the coming citizenship, and are aiming to conserve health and prevent disease among the children instead of doing as has for the most part been done in the past—merely sit with folded hands and wait for disease to step in, and then feebly try as best they may to combat it. Mayor Thompson is entitled to the thanks of the entire community for the stand he has taken in this movement, and in no less a degree the Health Commissioner and Superintendent of Schools are to be commended for their hearty coöperation. Dr. A. P. Baur, the efficient supervising dentist of the health department, also worked hard for the success of "Dental Week," and deserves the thanks of the parents of the school children throughout the city.

Such work as this is constructive in the highest degree. It works harm to no one and good to a great many. It is the best form of charity because it helps people to help themselves, and teaches them that hygiene if properly carried out is a distinct community asset. We need more practical teaching of this sort and less platitudes, more of the essence of right living and less on the most approved method of dying. We need community and concerted action instead of mere individual effort—in short we need more men like the city authorities of Chicago and we would have a better city and a better world.

THE MIDWINTER MEETING OF THE CHICAGO DENTAL SOCIETY.

As announced on another page the midwinter meeting of the Chicago Dental Society will be held at the La Salle Hotel, on January 26-27, 1917. This promises to be one of the most notable events the society has ever had, and one of the most pleasurable. The distinguished gentleman who will read a paper the first evening needs no introduction to an audience of professional men anywhere in the world, and the dentists and medical men of Chicago and vicinity have in store for them a rare treat. Dr. Bloodgood may be assured of an audience which will inspire his very best effort and give him an opportunity of accomplishing much good. The clinics on both days will be varied and most interesting, and no one need go away without learning enough to pay him for traveling many a mile to attend. The welcome of Chicago to the profession from outside is always hearty and sincere, and we are hoping on this occasion for a very large attendance of visitors from a distance.

To crown all, the banquet on Saturday night will be of unusual interest. The principal speaker, President Vincent, is one of the great orators of the day, and never fails to be entertaining and instructive. But after all the chief joy of the event will be the privilege of honoring the guest of the evening. Dr. Edmund Noyes is in every way so very worthy of all the good things that can be said or done for him that it is an especial pleasure to be able to honor him in this way. He is one of the great men of the profession—great because he has ability, because he has integrity, because he has character; and greater still because he has those lovable qualities of charm and modesty which endear him to his ever widening circle of friends. When dentistry seeks to honor Edmund Noyes it is only paying back in small measure the great debt which it has owed him for years, and this banquet will merely typify in a limited degree the love and respect which the profession holds for this splendid man.

Come to Chicago for the midwinter meeting and you will be twice glad—glad because you came, and glad because you have made us glad.

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. I.

My Dear Boy:—You were told on graduation day that the world lay before you, and this was true. Be careful that it does not remain before you all your life—that you never quite catch up with it. Remember that the world refuses to stand still to accommodate itself to the slow-going pace of many a young man. I am so anxious about your future that I want to call your attention to a few of the things which seem to me significant as affecting your prospects in life. I have worked with young men so long, and have watched their careers with so much concern that I grow ever more and more anxious as I see them starting out in life.

I have seen so many of them begin with a brilliant promise of success only to waver and fall by the wayside, and I have seen others with a meagre prospect, and with a handicap that was heartbreaking, eventually win out and achieve distinction and success. And watching all of this I have been forced to the conclusion that opportunity and chance are merely incidental in the game of life, that the thing of prime importance is after all the tendency, the temperament, the disposition, and the determination of the young man himself.

I am going to ask two things of you. First that you face yourself as an honest man, searching into your very soul for the motives which prompt you in your professional attitude toward the world, looking deep down into your inner consciousness, analyzing your every purpose, weighing every impulse, sounding every aspiration; and then with all of this before you, in perfect candor, judging of your attitude toward the profession and the public—whether you are in dentistry merely for the money that may be made, or whether somewhere in your mentality there is a spark of enthusiasm for the profession itself aside from the gold that may be gained by it. I am not blind, and I do not deceive myself. I know full well that most young men enter a profession because they think they can make some money by it; at least they feel that they can get a good livelihood. There is no use blinking the matter, because this is a fact. The instances where young men select a profession for the pure love of the calling itself are very rare; nor need we lament this nor wonder at it. In youth ideality is undeveloped and the material is predominant. We grow into the higher things of life by experience, and yes—sometimes by suffering.

And this is the point I wish to make; if after your experience in college you have not developed a liking for the profession, if there is no glow in your heart when you think of some of the operations you have performed, if you have not reaped a pure satisfaction from the fact that you have relieved pain for your patients, if you still think that money is the sole object of professional life; then I beg of you in the name of humanity and your own conscience, in the name of all that is honorable and decent and commendable, to sever your connection at once with the practice of dentistry and go into some other pursuit. In the first place you will make but a meagre success if you remain in it, in the next place you will not be in harmony with your environment, and will get little pleasure out of it; and last and most important of all you will never do full justice to your patients. So I beg of you in all conscience not to remain in a calling in which you can not put your whole heart—particularly one like dentistry where much heart is required.

In case you do find after careful deliberation that you have developed a love of dentistry then I welcome you in the most cordial manner into the ranks, and this is the second thing I have to ask of you. Having decided that you possess sufficient enthusiasm to justify you in entering upon the practice of dentistry, I want you to stop now at the threshold and think seriously of the obligation you have assumed. Your relation with the public is to be different—should be different—from the relation of a man in ordinary business. The man in business sells commodities, you are to dispense service. He deals with things, you with individuals. A dishonest act or a mistake by him may involve financial loss, the same thing with you may involve human comfort, human happiness, and even human life. Think of these things—they are fundamental.

I am not writing for effect, nor for the purpose of preaching to you. I am merely placing the most profound facts of professional life before you. I ask you to accept them now when they are presented to you, and not go through the long and toilsome process of finding them out for yourself by painful, and sometimes by bitter, experience. If you shape your course in the light of this relationship with the public, then I can promise you a life of usefulness, of service, and of sacrifice—which is almost equal to saying a life of happiness. In my next letter I will say something to you about starting in practice.

Sincerely your friend,
C. N. J.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Extracting Large Cuspids:—In extracting heavy rooted cuspids the extration of the adjoining teeth first will facilitate their removal.—*F. A. W.*

Fitting Wax for Inlays:—When making an inlay for a proximal cavity in a bicuspid or molar try a matrix and see how nicely it works. If properly trimmed it will not interfere with the occlusion.—*James W. Cormany, Mount Carroll, Ill.*

Care of Hands in Laboratory:—Before opening vulcanizer, or working in plaster, or with flasks, if you will wash hands in soft water with good soap, and, while still moist, pour on and rub in olive oil, you will find when you are ready to cleanse the hands that the stains have not penetrated the skin.—*J. M. H.*

To Prevent Gagging During Impression-Taking:—To take an upper plaster impression without gagging the patient, have your mouth mirror at hand, and just as you press the tray of soft plaster to roof of mouth place mirror directly back of tray in the palate. As you press the plaster up the excess flows back against the mirror. Pull it forward and back, thus avoiding a mess of plaster on the soft palate. This avoids possible choking.—*W. C. Shallenberger, Chicago.*

Treatment of Alveolar Abscess:—After having made incision through the tissues to open abscess, paint the extreme edges of the wound with 95% phenol. This serves a double purpose, it acts as an anesthetic in minimizing pain caused by passing probes, etc., it also prevents any tendency for the soft tissues to heal and gives wound time to granulate up from the bottom. The treatment should be applied from time to time when frequent dressing are necessary.—*A. G. Salisbury, Takaka, N. Z.*

Flowers:—Trees and flowers and plants do not travel. And yet you will see persons turning them around daily and moving them from one place to another and their pains are rewarded by the death of the plant. Try letting your plants alone for a while. Mark the pot on the side next the window and if you have for any reason or other need to move the plant, replace it exactly as it was. Surely the plant will get lopsided and reach out for the sun, but it will thrive. Plants will grow for any one if given light, air, water and let alone.—*Homer Almon.*

The Ethyl-Chlorid Spray for Inflammation and Pain:—To reduce inflammation and stop pain, the ethyl-chlorid spray has been found invaluable. Where the tissues have not been broken or lacerated the parts are sprayed until frost just begins to form, and this repeated several times. When the tissues have been lacerated the spray should be applied as near as possible without getting it on the raw surfaces as this would cause great pain for the moment. Sensitive teeth should be protected by wax or modeling compound. Frequently the spray is applied externally. The effect is quite permanent (that is, not merely anesthetic) and the relief from pain often almost instantaneous.—*Frederick W. Stephan, Chicago, Ill.*

A Varnish Container:—Manufacturers have been singularly slow in grasping the proper kind of container that should be furnished with the various varnishes that are used to coat the modern silicates. Until they help us out the difficulty can be in large measure overcome by transferring the varnish to any sort of bottle with a ground glass *cap* instead of ground glass *stopper*. If the preparation is one that has ether as a solvent it is best to cut an air vent on the inside of the glass cap. This can be done in a moment with a sharp-edged carborundum stone. By thus allowing a slight air vent at all times the liquid will evaporate only very slowly and the neck of the bottle will stay in a clean and presentable condition a much greater length of time. Of course the liquid must be diluted from time to time by the addition of a small amount of ether.—*Arthur G. Smith, Peoria, Ill.*

Preparedness:—The proclaiming of a Dental Week by the mayor of Chicago in which the children have their mouths and teeth examined and put in efficient condition, is a grand progressive movement. Now that the crusade of the juvenile tooth is on, why not start the tooth-brush to work in the early life of the temporary tooth, say when a child is one year old? If the temporary teeth are well brushed from the time of eruption the decay is surely reduced fifty per cent over those that are not brushed. When decay is reduced in temporary teeth to a minimum, the permanent tooth when it comes has a much better chance for perfection than when surrounded by a bad lot of decayed temporary teeth. If every dentist would take it upon himself to enlighten the parents of the vital importance of the early use of the tooth-brush much might be accomplished; the prevention of a disease is of more importance than the cure, for few dentists possess the ability to properly treat and fill deciduous teeth.—*S. G. Barker, Jefferson, Iowa.*

A Bit of Technique:—Following is given my method for gaining access to all the root canals of a molar tooth having a live and exposed pulp, the exposure being disto-proximal, without so seriously weakening the tooth as to result in either the buccal or lingual wall being broken away in mastication. Apply the rubber dam, then carefully remove the decay and weak walls, being very particular about the margins of the cavity. If this preparation of the cavity can not be accomplished at the first sitting it can be done in most cases at the second sitting. Then place a disc containing devitalizing paste over the point of pulp exposure, then insert a permanent filling, or some substantial temporary filling, leaving it thus for one or two weeks, according to the nature of the case, then with a bur cut into the pulp chamber through the mesial half of the occlusal surface, which will give direct access to all the canals, all subsequent treatments to be given through the occlusal surface.

When the canals are filled and a filling inserted in the occlusal, the tooth is finished except in cases in which a temporary filling was used in the original cavity. In such cases the temporary filling would be replaced by a permanent one, of course. In dealing with a molar having a dead pulp it should be dealt with in the same manner as described above except that other and appropriate medicines would be used, and the cutting into the pulp chamber through the mesial half of the occlusal surface can be done at the same sitting. This method obviates such weakening of the tooth as results if the original disto-proximal cavity is sufficiently extended to enable the operator to gain access to all the canals.—*H. A. Cross, Chicago.*

MEMORANDA.

STATE BOARD OF DENTAL EXAMINERS.

The North Dakota State Board of Dental Examiners will hold their next meeting in Fargo, beginning Tuesday morning, January 9th, 1917. All applications must be in the hands of the secretary at least ten days before the examination. For blanks and further information write the secretary, W. E. Hocking, Devils Lake, N. D.

"FIFTY-FIVE MODERN DENTAL OFFICE PLANS."

The Ritter Dental Manufacturing Company of Rochester, N. Y., has prepared an attractive little book showing the plans for fifty-five offices. To those who contemplate changing their offices these plans will prove valuable in suggesting various combinations as a basis for individual adaptation and arrangement.

A lantern slide illustrating the temporary teeth and the first permanent molars has been prepared by the Lambert Pharmacal Company, St. Louis, Mo., manufacturers of Listerine, and they will be glad to supply it free of cost to any dentist or oral hygiene society on request.

This slide is in color and each tooth bears an individual reference number, thereby making it convenient for the lecturer to designate it in his talk.

A short text directs attention to the first of the permanent teeth to be erupted—the molars—thus affording the lecturer opportunity to clearly impress his audience with the importance of their preservation and to instruct them to guard against the neglect from which they often suffer by reason of a popular belief they are temporary and will be replaced.

The slide is of the regulation size and therefore can be used in any motion picture show or private exhibition employing a stereopticon or picture machine fitted with a stereopticon.

MIDWINTER MEETING, CHICAGO DENTAL SOCIETY, FRIDAY AND SATURDAY, JANUARY 26-27, 1917, HOTEL LA SALLE.

The annual midwinter meeting of the Chicago Dental Society takes place Friday and Saturday, January 26-27, 1917, in the La Salle Hotel. The following is a summary of the two-day meeting:

Friday, all day, Manufacturers' Exhibit which includes a complete exhibit of everything pertaining to a well equipped dental office and laboratory

Friday evening at eight o'clock in the large banquet hall, 19th floor of the La Salle Hotel, Dr. Joseph Colt Bloodgood of Baltimore will present an address, "The Pre-existing Lesions in the Oral Cavity and Their Relation to Malignant Diseases," with lantern slide demonstration.

Dr. Bloodgood is a physician of international reputation, a most enthusiastic worker along these lines and one of our greatest authorities on this subject. We may rest assured that his presentation to the dental profession will mark a red letter night in our dental society history.

Saturday, all day, beginning at nine o'clock, large clinic given by a great number of carefully selected clinicians from various parts of the country demonstrating practically every phase of modern dentistry.

Saturday evening, at seven o'clock, Annual Banquet given in honor of our esteemed confrere, Dr. Edmund Noyes. Dr. Noyes' long and highly efficient record in the service of humanity and the dental profession has placed him in a most enviable position. In tendering this banquet in his honor we are highly honoring the dental profession.

Dr. George E. Vincent, president of the University of Minnesota, will deliver the address of the evening. Dr. Vincent needs no introduction to a Chicago audience for he was formerly a resident of this city and was connected with the University of Chicago for many years before accepting the presidency of the University of Minnesota. Dr. Vincent is one of the most intellectual and forceful speakers in this country and we are assured of a highly profitable and entertaining evening.

The annual banquets of the Chicago Dental Society have always attracted large and interested audiences and the coming affair will be no exception to the rule.

C. N. Johnson,
L. E. Bake,
Fred W. Gethro, Chairman,
Program Committee.

DENTAL AND FACIAL SURGERY TO AID AMERICAN HOSPITAL AT NEUILLY, FRANCE, MRS. ARCHIBALD FREER, CHM.

THE ALLIED BAZAAR, CHICAGO COLISEUM, JANUARY 11-20, 1917.

To know a few items concerning two of the booths at the coming Chicago Allied Bazaar may be of interest.

The B. F. B. Permanent Blind Relief Fund Booth is to aid in the splendid work for these afflicted men who, having given their sight for their countries, must now be taught all over again to be useful men.

What can be taught nowadays is almost incomprehensible to those of us who have been used to seeing the blind relegated to the ranks of brushmakers. Now they are stenographers, workers in many trades; they are enjoying such sports as rowing, fencing and tug-of-war. They are learning gardening and many other out-of-door occupations, *but, they need our help.*

In a recent letter from Sir Arthur Pearson (blind), president of St. Dunstans' Blinded Soldiers' Hostel, in Regent Park, London, he writes: "I hear you are interested in what we are doing for the men who have lost their sight at the war. We are quite full up here with over two hundred men and there are seventy more in hospital waiting to come to us as soon as they are fit. Owing to the recent casualties, the number of blinded men has increased lately to an appalling rate, but as we have been offered the use of Regent's Park College, a vast building, just next to St. Dunstans', we shall, I hope, be able to cope with the situation."

WHAT GREATER APPEAL NEED BE MADE?

But, before these soldiers can be helped, they must pass through the physician's or surgeon's hands. Hence, the Dental and Facial, and the Surgery Fund Booth of Allied Bazaar to aid American Hospital at Neuilly, France. Not only do the soldiers lose their sight but often, too, much of their faces. These latter wounds call into service the facial surgeon, and it is in the American Hospital at Neuilly, as well as elsewhere, that such wonders have been performed in this line.

Often ribs and other bones must be taken to rebuild the jaw and nose bones. New ears must be made, and faces too terrible to look upon may, by the skillful surgeon, be re-created, unscarred, almost to perfection.

In this field of surgery the American has distinguished himself, and we wish our fund to be a tangible expression of sympathy from this city of Chicago to the mutilated soldiers, so greatly in need of the facial surgeon.

An especial appeal is made at this time to the dental profession to assist in this important work, to the end that the splendid traditions being maintained by the American dentists abroad shall be echoed by the support of his fellow-practitioner at home.

One of my fourteen "children of the war" has been wounded in the face, but, well again, he is off to the battle front. When he first went to the war, then but 17 years old, the question being asked of this orphan boy: "In case of death whom shall we notify?" he had to answer, "No one." Now on being thus questioned, he writes he is happy to answer "My Godmother in Chicago." These letters truly bring tears to our eyes, and what is it in our power that we will not do for these young and valiant defenders of liberty and justice?

Eleanor E. Freer.

THE FORSYTH LOVING CUP

A loving cup will be formally presented to Mr. Thomas Alexander Forsyth on the evening of January 20th at a banquet to be given in his honor at the Hotel Somerset, Boston, Mass. It is expected that at least five hundred dentists will be present at this banquet.

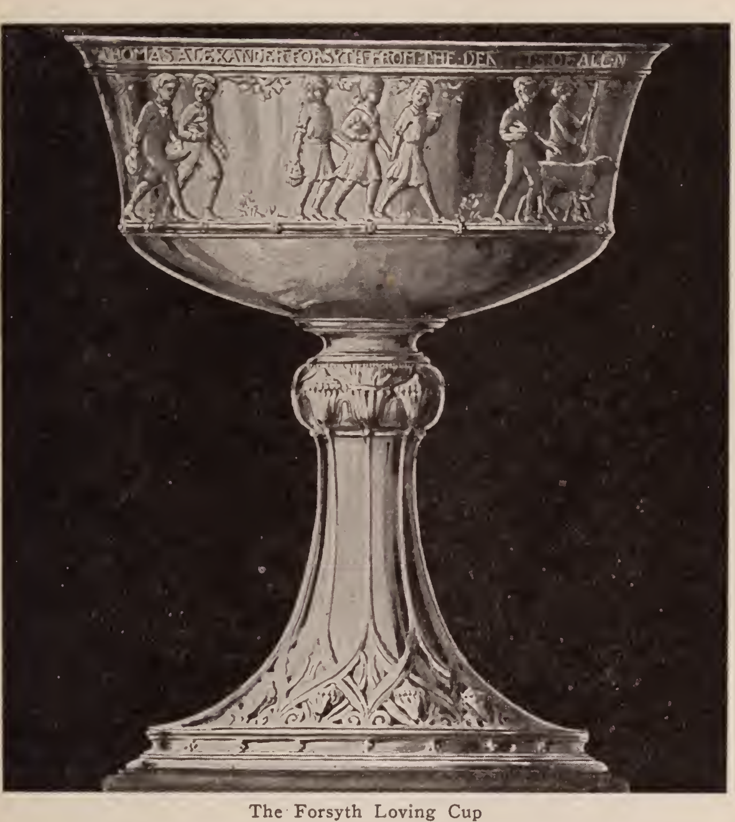
The editor of *Oral Hygiene,* Dr. W. W. Belcher, raised over twelve hundred dollars in twenty-five cent subscriptions for this loving cup. Between four and five thousand dentists contributed to it.

The cup is a work of art, produced by Tiffany & Co., New York City, and was selected in competition with other designs by a committee appointed by the editor of *Oral Hygiene* for this purpose. It is a child's cup with the many figures around the bowl—some eighteen in number—all symbolizing happy childhood life and breathing the spirit of the Man of Galilee, "Suffer little children to come unto me."

On the upper portion of the bowl is the inscription reading: "To Thomas Alexander Forsyth from the Dentists of All Nations in Appreciation of the Benevolence of the Forsyth Family Who Gave to Humanity the Forsyth Dental Infirmary for Children—1917."

Dr. H. E. Friesell, dean of the University of Pittsburgh Dental Department, will make the formal presentation to Mr. Forsyth in behalf of the dental profession. A committee composed of members of every dental society in Massachusetts, including Greater Boston, is working on the details of the banquet. Dr. Albert L. Midgley of Providence, R. I., is chairman of the same.

Members of the dental profession are cordially invited to attend this presentation and banquet—price per cover, $5. Tickets may be secured by addressing Dr. A. H. St. C. Chase, 129 Marlborough street, Boston, Mass.



The Forsyth Loving Cup

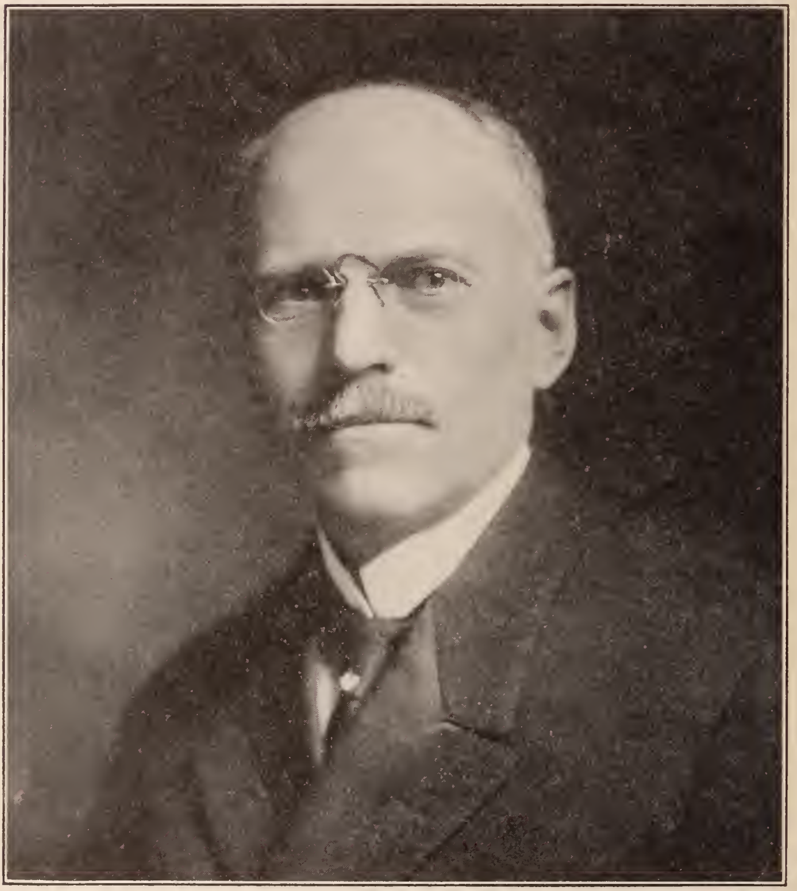
OBITUARY.

DR. RUDOLPH H. HOFHEINZ.

Born at Heidelberg, Germany, October 21st, 1856. Died at Rochester, N. Y. November 23, 1916.

Entered the "Lyceum" at the age of nine.

After the death of his parents he came to America, May 23, 1871.



Dr. Rudolph H. Hofheinz

Entered the New York College of Dentistry in 1876, graduated with the highest honors in 1879, having bestowed upon him the gold medal in recognition of attaining the highest marks in examinations.

Has been in constant practice in the city of Rochester, N. Y., till his death.

In 1896 received a call as professor of operative dentistry to Buffalo University. Filled this chair until 1909 when ill health compelled him to resign. Was made professor emeritus of the Buffalo University. Was twice president of the New York State Dental Society, also president of the Seventh District Society and of the Rochester Dental Society. Was offered the presidency of the National Society of Dentists which he had to decline on account of ill health.

He was trustee of the Rochester Dental Dispensary and principal of the Hygienists School.

The sudden taking away of Dr. Hofheinz, while in one sense not altogether unexpected, was after all a severe shock to his friends. He had been ailing for years with a weak heart, but in the recent past he seemed in a measure to have regained his health until within a few weeks of his last illness. He leaves a place in our profession which it will be difficult or impossible to fill. Sturdy in his honesty, genial in his disposition, high in his ideals, and lovable n his nature, he occuped a position among men of no mean proportion. As a dentist he had more than ordinary ability, and was always foremost in the investigation of any new idea or theory of practice. He was ever conservative and sane in his judgment and was thus of great service to his profession. He leaves a widow, who was his loyal helpmeet and his chief inspiration in all he did.

DR. GORDON WHITE.

Dr. Gordon White of Nashville, Ten., one of the leading and best known dentists of the south, died at his home December 6, 1916. He had been ill about five months, though not supposedly seriously so till within a few days of his death. Dr. White was a man of signal ability along certain lines, particularly in the treatment of pyorrhea alveolaris, and in orthodontia. Some of the cases which he carried through to a successful termination were unique and very interesting. All that he knew he cheerfully gave to the profession and while he was not regularly connected with any college as a teacher he was in reality a teacher of men.

His genial personality endeared him to a large circle of friends, and he was universally respected by his community as well as by the members of the profession which he loved. The world is better because he lived in it, and it is sadder because he is gone.

DR. B. F. ESHELMAN.

Before we go to press word comes that our good friend—the profession's good friend—Dr. Eshelman of Los Angeles has suddenly passed away at his home, of heart failure. Few men ever held the love of his fellows as did Dr. Eshelman. He was great and good, and lovable and beloved. If more could be said of any man we would say it of him, but the most we can do is to pay our tender tribute to his memory, and extend our heartfelt sympathy to his family.

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THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, FEBRUARY, 1917 No. 2

THE SYSTEM OF MOVABLE REMOVABLE BRIDGEWORK IN CONFORMITY WITH THE PRINCIPLE THAT "TEETH MOVE IN FUNCTION."*

BY HERMAN E. S. CHAYES, D. D. S., NEW YORK.

We may stimulate life processes and thus for a time induce a greater degree of livingness. We may do this by relying on external, extraneous, foreign, or therapeutic agents which will act directly upon certain organs and drive them unmercifully to greater activity, leaving them exhausted in the end, or we may by means of air, water, proper food and careful exercise, which brings about intermittent pressure, induce a constantly recurring current or restimulation which will activate the life processes to greater expression, and so in time, make them the source of the restimulating factor.

Life in the abstract, general, universal or unlimited sense is a complete cycle of such phenomena with the restimulating factors inherent in the activities themselves, so in a sense, these activities and life are synonomous.

Life in the concrete, the limited, the personal and particular sense is a complete cycle of such phenomena, with the restimulating factors inherent in the activities themselves, but to the individual in a constantly less appreciable degree and hence producing a constantly diminishing result or activity.

Like begetting like, this diminished activity will induce restimulating factors of minor influence upon the life processes, the latter will become sluggish and katabolices sets in.

Thus we, as individuals, are subject to the law of change, we are not and cannot, expect to be permanent fixtures of the great cosmos, forever expressing itself in the creation of new centres or vehicles for the display of its endless energy.

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*Read before the Wisconsin State Dental Society, July, 1916.

For the reasons stated above, all human work is limited and transitory that is not permanent in its effects or results. The things we do are as much subject to these changes as we ourselves are. This applies particularly to our endeavors when they are concerned with attempts to prevent or inhibit the reduction of that cycle of our activities which are synonomous with life.

We are forever falling short of our ideal conception of a task when our task consists in an effort to balance income and expenditure of human energy, and it will ever be so, no matter how we may improve our relations between our vegetative and objective life, or how much we may learn of the mysteries of the biochemical life processes themselves.

But it is equally true that constant effort to correct understanding of these things, must result in improved conditions which will enable us to husband the now vastly dissipated energy, and so prolong our activities and usefulness to a constantly growing degree.

Intuitively, we are all aware that this is true, the best proof of it being that we are in constant search for means of so improving our remedial efforts for our patients, that they, the efforts, will result in an harmonious interplay of the intact functioning organs and the artificial work.

We must, therefore, face the self-evident proposition that the cruder our remedial efforts are, whatever organ we may be working upon, whatever our sphere of activity, whether it be general medicine or surgery or the specialized field of dentistry and all its kindred divisions, the less acceptable will the results be to the other functioning organs, this means immediate rebellion on their part, and unless the cause be removed, must result in a physical state which is physiologically minus and pathologically plus! Conversely, the more finished or refined our efforts are, the more acceptable will the results be to the other functioning organs.

A finished or refined remedial effort, in behalf of any organ, implies a knowledge of its individual and relative anatomy or physical relationship and a comprehensive understanding of the physiologial functions of that organ.

BRIDGEWORK, DEFINED AND CLASSIFIED.

Bridgework is the art of supplying edentulous spaces with artificial teeth in such a manner as to definitely limit their vertical and lateral disbursement by using some natural teeth or roots which are present as piers or abutments. Bridgework is divided into two systems—the fixed and removable systems—and here I wish to go on record with the statement that in dividing bridgework into two systems—fixed and removable—I controvert the possible accusation of my ultra radicalism. I am willing to concede that there is a system of fixed bridgework, or that it is possible that some men consider that there is a system of fixed bridgework, and that there is some room for the practice of such a system, and I have therefore, attempted to work out a technique for such a system, which, while not being conducive to the health of the patient in the full sense of the words, yet, partially condones the practice by rendering it less harmful than in the past. For the moment then, we shall divide bridgework into these two systems—fixed and removable! Both are classified in accordance with the teeth involved, as simple, compound, complex and cantilever.

SIMPLE BRIDGE.

First, a sample bridge is one where the artificial substitute and the piers are subjected to the same physical stress, that is, where the stress is exercised in the same direction. Example: Supplying a second upper or lower molar, using the third and first molars as abutments, or supplying the two upper or lower centrals, using the laterals as abutments (not an advisable procedure).

COMPOUND BRIDGE.

Second, a compound bridge is one in which the artificial substitute, by virtue of its position and acquired occlusal relation, is subjected to a stress different from that which works upon the abutments. Example: supplying a lateral incisor, upper or lower, using the cuspid and central as abutments! Or supplying a second lower bicuspid, using the first molar and first bicuspid as abutments.

COMPLEX BRIDGE.

Third, a complex bridge is one in which the artificial substitutes are subjected to a stress wholly foreign to the stress of the abutments, and where the abutments are situated upon opposite sides of the arch. Example: supplying four anterior teeth, using the cuspids as abutments, or supplying the four incisors and the four bicuspids and first molars, using the cuspids and second molars as abutments or piers.

CANTILEVER BRIDGE.

Fourth, a cantilever bridge is one which is attached to natural abutments at one end only, and depends upon the resilient mucosa for its major support. Combinations of complex and cantilever bridges may exist, such as cases presenting anterior abutments upon both sides of the arch and posterior abutments on one side only. The practice of all bridgework must be subject to certain essentials, none of which may be overlooked without impairing the value of the fixture as an accessory to the health of the patient, and, broadly speaking, may be summed up as follows:

ESSENTIAL FACTORS IN BRIDGEWORK.

First, the mechanical essentials of a bridge are abutments, attachments, saddle, and artificial teeth. Second, macroscopic essentials of a bridge are the correct mesio-distal, bucco-lingual and gingivo-occlusal measurements of all the mechanical essentials. Third, the surgical essentials of a bridge are the extirpation of the pulps when necessity for this operation exists. The correct cleaning out and filling of the root-canals and the proper preparation of the pier teeth or the cavities within them. Fourth, the physiological essentials of a bridge are the interplay of the surgical and mechanical essentials with the adjacent and subadjacent tissue in such a manner as to facilitate the occurrence of intermittent pressure upon the subjacent resilient mucosa during mastication. Fifth, the phonetic essentials of a bridge will be complied with when its form has been correctly produced, for only then will it play its part as a resonator, amplifier and articulator of sound.

Because dental bridgework usually and nearly always means an artificial fixture for the human mouth, it may be broadly defined as a dental operation. Any dental operation may be correct or incorrect, and a correct dental operation may be defined as one, the result of which is conducive to the health of the individual upon whom the operation is performed. And we understand under the term "health" the maintenance of that vital balance which is expressed by the normal functioning of all organs which compose the human body.

The teeth are organs of incision, prehension, mastication, and as accessories of vocalization, speaking or singing, have these varied functions to perform. To be best suited for this task, Nature has caused them to acquire in the process of their development certain qualities and certain definite structural shapes. Any deviation from their macroscopic normality and their microscopic organization. causes a lack of functional efficiency and interferes with their normal contribution toward the maintenance of vital balance. Hence all dental efforts should be directed toward a re-creation of macro- and microscopic acceptableness of these organs when they require our attention at all.

IMPORTANCE OF INTERPLAY PARTS

In health, teeth, gums, in fact, all organs in the animal body, perform their function as a matter of grateful exercise without undue consciousness on the part of the animal, contributing to the maintenance of an efficient organization in which the income is greater than the expenditure to obtain this income. But in order to obtain such a condition we must have perfect interplay of all organs, making up the animal body, and the first requisite for perfect interplay is absolute lack of interference by one organ with any other one or more organs.

We have had our lectures in anatomy of the teeth, and we know what they look like, or we should know. We have had our lectures in physiology, and we know what the gums and adjoining structures look like in a healthy mouth! We have likewise been able to learn the beautiful lessons of occlusion. All these should have given us a picture of healthy conditions not easily erased. And it is this picture we must ever seek to re-create, and we cannot re-create it *en masse* unless we re-create it in spots, in individual teeth and their surrounding gingivae.

Let me call your attention to a remarkable realization we must come to, all of us who would endeavor to obliterate the effects of human error upon the human system. Every molecule which makes up the human or animal, or plant body, is in a state of constant rhythmic movement, which motion is in definite geometric relation to the motion of the molecules neighboring it, which warrants the conclusion that the molecules influence one another by their rhythmic movements to the point of causing corresponding geometric gyrations in each other.

This is, of course, not a matter of first causation, that is not a matter of life inception, but rather a matter of life maintenance by virtue of the maintenance of the equilibrium.

If we conceive the animal as a delicate clock or watch, for example, we may obtain a concrete illustration of the interrelation of all the organs. Let us assume that we are accelerating the minute hand of a clock by slowly rotating it to the right (take out your watch and make the example more concrete), we can readily understand that we shall by this act influence the entire mechanism to a more accelerated motion, and that this motion will be in definite relation to the intensity of the accelerator force, and that there will be a definite rhythmic and geometric relation between the motion of each separate piece of mechanism which makes up the whole of the clock.

If we now remove the influence of the accelerator force an immediate rhythmic and geometric adjustment takes place, and the hands of the clock proceed to travel at the original speed. This may be called a stimulating interference with the mechanism and results in a greater amount of work or activity being done in a given time than the apparatus was intended for. If we now place the hour hand at the numeral "9" and the minute hand at the numeral "3" and suspend a minute weight from the extremity of the hour hand, we shall have an inhibitory interference with the mechanism, resulting in a given amount of energy, doing a smaller amount of work than the apparatus was intended for. The spring will uncoil, or attempt to uncoil, at the same ratio, but its effect upon the wheels, and through these upon the hands, will be less marked than before. Again there will be a rhythmic and geometric readjustment between the various parts of the clock, and another readjustment to normal when the inhibitory interference is removed.

Up to a certain point these experiments may be repeated without impairing the inherent virility of the spring, but as soon as the point of impairment is reached a rhythmic readjustment becomes impossible, a lack of perfect interplay manifests itself, resulting in a heedlessness of expression! The parts interfere with one another, and a great deal of energy is expended to bring about a result, work which is as unsatisfactory as it is unreliable.

MOBILITY OF NATURAL TEETH.

For the purpose of elimination of mechanical shock to the nervous system during mastication, and for the purpose of enhancing the vibrating effect produced during vocalization, be it singing or speaking, also for the purpose of minimizing mechanical injury to the teeth themselves, the latter are held in their bony sockets, through the intermediary agency of an elastic membrane, which is so disposed beneath and around them, as to fairly hold them suspended in a resilient cushion.

The elastic fibres composing the membrane disposes themselves longitudinally, diagonally, transversely and circularly around the teeth! They interlace with the periosteum and with the gum tissue, and thus, during the exercise of dental function, they effect an increase in circulation into the surrounding parts, which constantly brings fresh nourishment to these tissues.

The very structures of this elastic membrane and its peculiar function, precludes the possibility of an abundant blood supply and makes it a ready prey to inhibitory interference. Such inhibitory interference may be brought about by impaction of foods into what are known as interdental spaces, more by the accumulation of calcific material known as tartar, either upon or around the neck of the tooth, or upon portions of the root. The impaction of foods into the interdental spaces may be caused by the malrelation of the adjoining teeth (malocclusion), or by the improper restoration of proximal surfaces of teeth calling for dental attention. An inhibitory interference may also be brought about by a break in the continuity of surface upon a tooth in the region mentioned. A tooth may be filled, inlaid, or crowned, and a portion of the filling material may have been left extending beyond the margin of the cavity, or the crown may extend away from the gingival circumference exercising a pressure upon the surrounding gum tissue.

If pressure be exerted upon any one or two teeth in the mouth, the pressure will be transmitted to all the surrounding structures, and through them to all other teeth in the same mouth in a series of rhythmic waves or undulations of varying degrees, changing the physical outline of the surrounding structures in every direction. Upon the cessation of the pressure a rhythmic and geometric readjustment will take place in these tissues and a return to a condition of comparative equalibristic rest obtains. When there are no inhibitory interferences, that is, where the relation of the teeth is correct, as to position, condition and form, these pressure induced waves or undulations may take place ad infinitum with beneficial results, because under a correct condition, intermittent pressure is the essential stimulating interference inducing an increase of circulation, bringing with it a fresh supply of nutriment essential to life maintenance.

When inhibitory interferences are present, that is, when the relation of the teeth is not correct as to position, condition and form, each pressure exerted upon the teeth during mastication causes the same series of waves and undulations in the soft tissue surrounding them, but each wave or undulation causes these tissues to come in contact with injuring or bruising obstructions and the rhythm of recoil or readjustment is first interfered with and ultimately destroyed. Food debris, overhanging fillings, ill-fitting crowns, incorrect bridges, fixed or removable, open cavities, calcareous, or calcific and soft epithelial deposits, may all be classed as inhibitory interferences with a free and unhampered, undulating and very essential excursions of the soft tissues surrounding the teeth. All of them produce states not conducive to the health of the individual, and are therefore incorrect dental conditions. And any dental operations which will entirely eliminate them will be in operation conducive to the health of the individual, and therefore a correct dental operation.

EXERCISE OF TISSUE NEEDFUL IN HEALTH.

All tissues must be exercised, or, rather, they must have the freedom to indulge in such exercise as they need, and all tissues of all organs need exercise to keep them from undergoing atrophic changes. Hence, anything which would interfere with the free and unhampered undulations of the gum tissue, by any means whatever, results in pathological conditions by bringing about, first, a lethargic state in the tissue; second, diminution in vaso-motor actions, because of lack of re-stimulations; third, an accumulation of waste material in the cellular and intercellular substance resulting in a rapid death of cells; fourth, an atrophy or loss of tissue resulting in a physical change which makes it difficult to maintain a hygienic balance.

Besides serving as bacteriological breeding places, the usual kind of bridgework, which in the exercise of our vocation, we have often been called upon to clean and which we must now condemn, serves also to rob the teeth acting as abutments and a surrounding gum tissue of every change of free and unhampered motion, and such work brings about all the deleterious consequences mentioned heretofore. It will be well for us to remember that in all cases where teeth have been lost, and where artificial substitutes in the shape of bridgework are to be resorted to, the rational thing to do is to make the mucous structure carry the stress. The abutments or natural teeth, which act as supports for the bridge, must simply serve to prevent the vertical displacement of it during mastication, and they must so interplay with the bridge that they (the abutments) will be effectually kept from migrating into the fields other than their own. Outside of these two requirements nothing more should be expected from them. The bridge itself must during mastication gently and to a limited extent ride upon the alveolar ridge covered with the mucosa, and so be made to supply the intermittent stimulating interferences, essential for the enhancement of fresh nutriment by virtue of the increased pressure—induced circulation to the end tissues.

Artificial restorations in the form of bridgework must be constructed, so that they will not interfere with the maintenance of the hygienic balance essential to proper sanitation.

Wherever you find a crown, the circumference of which extends away from the gingival circumference of the tooth, you have discovered or uncovered an inhibitory interference with the maintenance of correct oral conditions. Any piece of bridgework presenting the possibilities of retaining food debris, or exercising an unequal pressure upon the alveolar ridge, or lacking in occlusal restoration, or lacking in anatomical acceptableness, is an inhibitory interference with the maintenance of correct oral conditions. The elimination of these inhibitory interferences, and the substitution of proper restoration in the cases involved, will, therefore, constitute operations conducive to the health of the individual, and so may be classed as a correct dental operation.

ABUTMENTS AND ATTACHMENTS.

What has been said of bridgework as a whole applies, of course, to abutments and attachments in detail. Abutments may be broadly divided into posterior and anterior. One of the first essentials in construction of these piers is rational and radical root work where the pulp is involved.

Time will not permit the treatment of this phase of the work, and we will be content to remember that if any root canals are here referred to we will assume that in the light of our present knowledge they have been properly treated.

The sum total of anchorage, that is, the sum total of contact surface between post and surface of abutments with the root, must be at least one-third greater than that part of the abutement which is exposed to grinding or triturating stress.

PREPARATION OF ROOTS.

This calls for a preparation of the root which varies as the direction of stress which these teeth are called upon to resist. The root end must present certain angles, and these angles vary in obliquity, *inversely as the stress,* that is, the *greater the stress the less oblique the angle.*

What has been said of the non-interference of the bridge as a whole applies most emphatically to the abutments. The continuity between the abutments and the root or tooth it rests upon must be left unbroken. Great care must be exercised not to encroach too deeply upon the subgingival area and the impairment of the peridental membrane must be carefully guarded against.

SIZE AND SHAPE OF POSTS.

No post which in size is large enough to threaten the integrity of the root should ever be used. If for any reason it becomes necessary to use a post longer than two-thirds of the root, the posts should taper for the gingival half of its length, and by cylindrical for its occlusal half, and its occlusal half should be threaded.

ABUTMENTS.

Anterior abutments in removable bridgework consist either of a root cope and tube, a root floor and tube, a lingual inlay and tube, or an artificial crown, carrying a slot of sleeve or post. Posterior abutments in removable bridgework may consist of a *telescope crown* (bad practice), or a shell crown when used containing a keyed slot or it may carry a tube or post either in a vertical or a horizontal direction. Or the root of the posterior teeth may be prepared to receive an inlay which in turn may carry a post either in a depression formed upon the inlay occlusally. Or it may carry a post attached to it in an upright position.

We must always remember that we expect these abutments to serve us in preventing vertical displacements of the bridge by their relation to the attachments which will engage them, that is, they must prevent any vertical displacement beyond the linear height presented by the displacement of the soft tissue during mastication, and that it would prove decidedly advantageous to so construct our abutments that they will engage our attachments in a manner which will admit of some latero-rotary play during exercise of usual functions. And, finally, any completed abutments must be so made that it will restore to the mouth a dental organ capable of exercising all natural functions—mastication, trituration, incision, prehension, and vocalization.

The principle involved in removable work is always that of the pontoon bridge, while that involved in fixed work is always that of the arch, span and suspension. A pontoon bridge is one which is supported through its entire length upon a yielding cushion, while a fixed bridge is one in which two or more piers carry a span of certain length.

Exceptions may be taken to this latter definition, and it may be urged that some construct their fixed work so that there is a definite point of support for each artificial tooth, making up the span which supports them obtain by scraping the model, so that the artificial tooth is fairly buried in the mucosa, and the answer to this would be, first, that such action is against all principles underlying the maintenance of nutrition in the end tissues, and that no matter how harmless the result may seem to be, it is at best tolerated by the tissues, and constitutes a condition not conducive to the health of the individual. It tends permanently to displace tissue from its proper environment, usurping the location for itself in a spirit on unfriendly conquest which nature always resents, and ultimately punishes us for.

The occlusion in abutments for fixed or removable work requires the very minutest attention, and the veriest ideal in occlusal restoration must be striven for if we seek permanence of work. Reference is here made to the final requirements of abutments, that is, all abutments must be so made that they will restore to the mouth a dental organ capable of exercising all normal functions—mastication, trituration, incision, prehension, and vocalization.

ATTACHMENTS.

Attachments are the intermediary agencies which link the artificial restoration known as bridgework to the abutments. They are made a movable or fixed part of the bridge as the case may require, which requirement will be made clear from a consideration of the study models and an exposition of direction of stress to which the abutments and the bridge will be subjected. Wherever possible it is best to have the attachments form the male portion of an appliance, which will be completed when this portion is inserted into a corresponding female part existing in the abutment.

The one essential fact to remember in the construction of abutments is that they must definitely and frictionally engage whatever space exists for them in the abutments, any lateral rotary play being provided by semi-tubular spring or claw construction, or by the provisions of an arc or sufficient curve to take into account the amount of soft tissue displacement during mastication.

If a box and friction plate be used, the box must be placed into the abutment and must run as nearly bucco-lingually as possible. Its shape must be that of the rectangle. The friction plate attachment is joined to the bridge, and it is so filed gingivally that it presents an arc, to which the straight floor upon the gingival part of the box shall be tangent. The sides of the friction plates are filed in the same manner. We thus produce three straight lines tangent to three curves.

IMPORTANCE OF PERFECT PARALLELISM.

The parallelism of the two abutments and attachments will enable the bridge to yield in a vertical direction under stress, while the curve upon as many sides of the friction plate will provide a lateral yield. A summation of the yield provided, plus the resiliency of the gum tissues will result in the latero-rotary yield essential, to all simulation of natural tooth movement.

We have mentioned the parallelism of the abutments and attachments, and we will realize that they are the essential mechanical requirements of a bridge. If the bridge is to be a fixed appliance, the abutments must be parallel, because we must be enabled to cement the bridge into position without exercising any pathological stress upon the pier teeth.

If the bridge is removable, abutments must be parallel so that the parallel attachments may engage them frictionally, and easily so that the appliances may ride gently, and to a limited extent on the mucosa during mastication.

In order to obtain such parallelism, certain instruments called a PARALLELOMETER and PARALLELODRILL, respectively, were designed.

THE ESSENTIAL IN THE MECHANICAL CONSTRUCTION OF ANY BRIDGE IS THAT IT SHALL GO INTO THE EDENTULOUS SPACE FOR WHICH IT IS INTENDED, WITHOUT EXERCISING ANY STRESS WHATEVER UPON THE TEETH OR ROOTS ACTING AS PIERS OR ABUTMENTS.

In a fixed bridge, this means that the abutments, whatever they may be, must be absolutely parallel. In a removable bridge, it means that the abutments or piers must be parallel to each other, and that the attachments which are to engage the abutments, must be absolutely parallel to the abutments.

The word "absolutely" is used, not in any relative sense, but in the real sense of its meaning.

Any abutment which during insertion or removal of a piece of bridgework is subjected to stress is a doomed member of the patient's dental equipment, unless the condition is obliterated by rectifying the error.

Parallelism of abutments is therefore the relative determinator of the mechanical success of a piece of fixed or removable bridgework. The smaller the span to be bridged, the more perfect must be the parallelism of abutments and attachments.

The parallelism of abutments should be inversely proportioned to the distance of the abutments from one another.

A deviation from the parallel must be unappreciable to the sense of sight or touch, no matter what the distance between the abutments.

THE DENTAL PARALLELOMETER.

The dental parallelometer is an instrument for carrying, placing and taking impressions of attachments for fixed and removable bridgework, at various distances, measured in micro-millimeter terms, and insuring the juxtaposition of these attachments to the respective abutments in equi-distant relation to each other.

It consists of two rectangular metallic sections (Fig. 1 A and B) and an actuating screw (Fig. 1 C) which engaging the section B and held down to the section A at the point of intersection of line A & B, C & D Fig. 5 will, when turned, cause a change in linear adjustment between A and B, Fig. 1.

Each metallic section carries three clamps, D, E, F, G, H, I, for holding in place the various mandrels used for carrying the various attachments, which a specific case may require, Figs. 1 and 3.

The body of the instrument is forty millimeters long. Its linear dimension may be increased to 55 mm.

The upper surface of Section A, Fig. 3, is graduated in mm. form from 1-40, the graduation being continued upon the engaging surface of the same section, from 35-55 mm. Figs. 4 and 5.

Fig. 6, is an end view of the engaging sections and shows the positive resistance to any deviation from a perfect horizontal.

Fig. 7, shows the parallelometer with five of the clamps in action, illustrating the peculiar system of measurement which enables us to obtain a constantly decreasing unit of measure by constantly increasing number of turns of the screw.

When the abutments of a bridge are more than 55 mm. and less than 40 mm. apart, clamp D, upon Section A (Fig. 7),

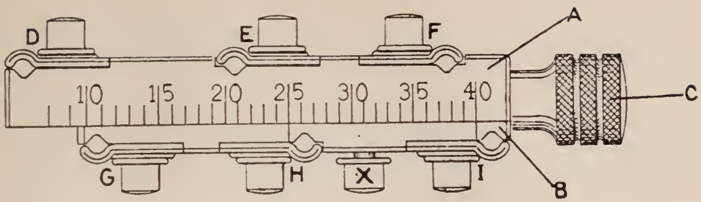

Fig. 1

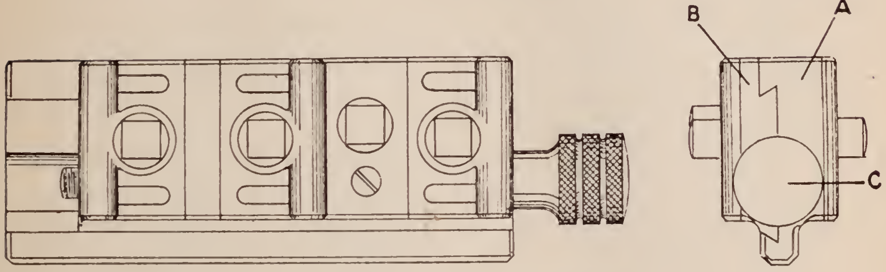

Fig. 2

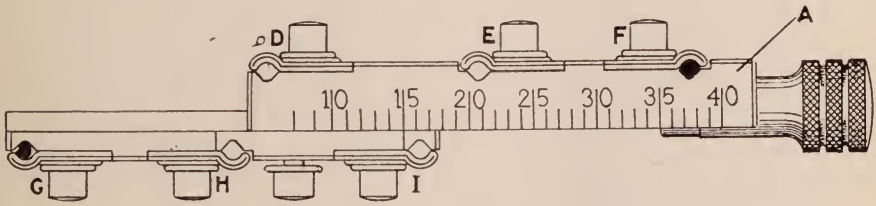

Fig. 3.

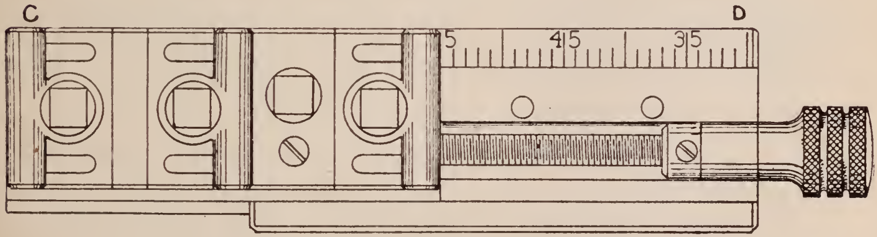

Fig 4

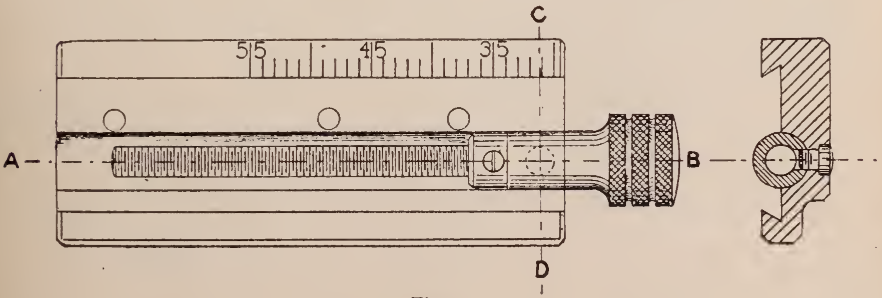

Fig. 5.

shall be the unit point and clamp I, upon Section B, shall be the movable point at which the mandrel for the required attachments shall be held.

When the abutments of a bridge are more than 10 mm. and less than 25 mm. apart, clamp D, upon section A shall be the unit point, and clamp H upon section B, shall be the movable point for holding the required mandrels.

When the abutments of a bridge are more than 7 mm. or less than 10 mm. apart clamp D upon section A shall be the unit point and clamp G upon section B shall be the movable point for holding the required mandrels.

When any two points more than 40 mm. and less than 55 mm. apart, are to be paralleled for attachments, clamp F, upon section A is to be used as the unit point, and clamp G, upon section A is to be used for the movable point for holding the required mandrels.

X, Y, Z is a right triangle, of which Z is the hypothenuse and Y Z the base.

Base Y, Z, carrying mandrels, and being the movable section is bringing these mandrels nearer to or further away from the mandrel held at unit point, clamp D, at apex of hypothenuse. It must be seen that here we have X, Z hypothenuse, being measured in terms Y, Z base.

The more closely G, H, I, approaches clamp D, the more number of turns of the actuating screw, C, would it require to complete a mm. distance, hence we have, a constantly increasing number of micro-millimeter divisions to each millimeter, as the distance between bridge abutments decreases.

Fig 8 presents three mandrels, 13, 14 and 15 gauge (Brown & Sharpe). They are used for carrying platinum tubes, A, B, C of corresponding diameters, the malls of these tubes are .007 of an inch in thickness. These mandrels are locked into the body of the parallelometer, one on each section, into clamp D, on section A, and into clamp G, H, I, as the case may call for on section B.

They are always perpendicular to the horizontal plane of the meter and the tubes placed upon these mandrels will therefore be parallel to each other.

As the actuating screw C, is turned forward or backward,

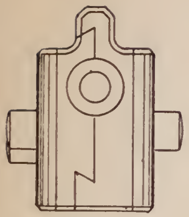

Fig. 6.

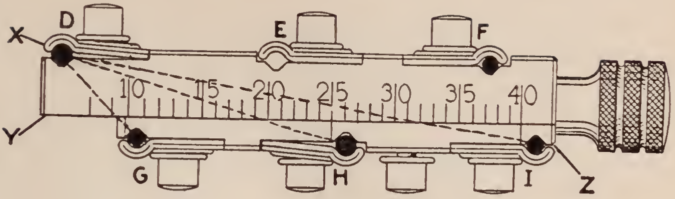

Fig. 7

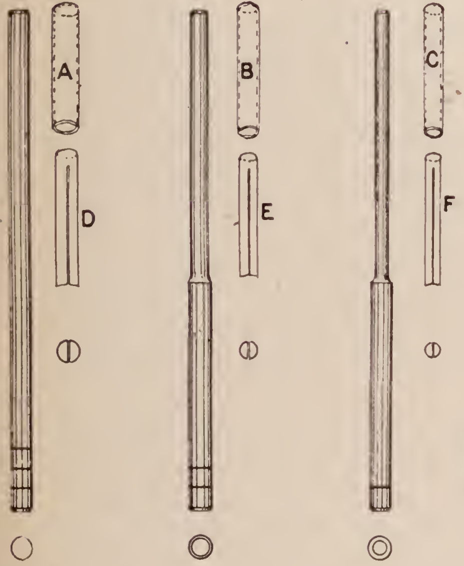

Fig. 8

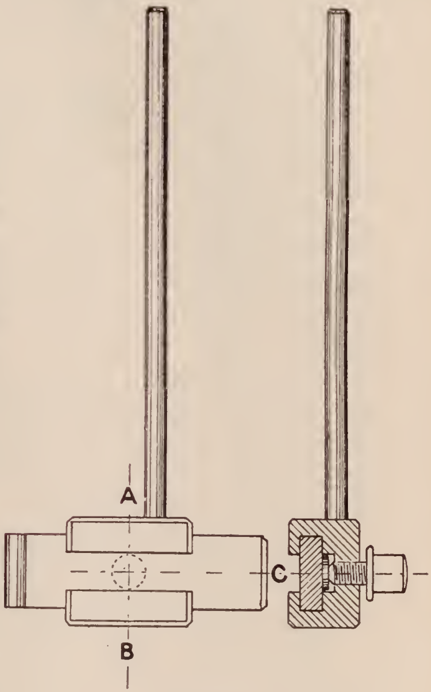

Fig. 9

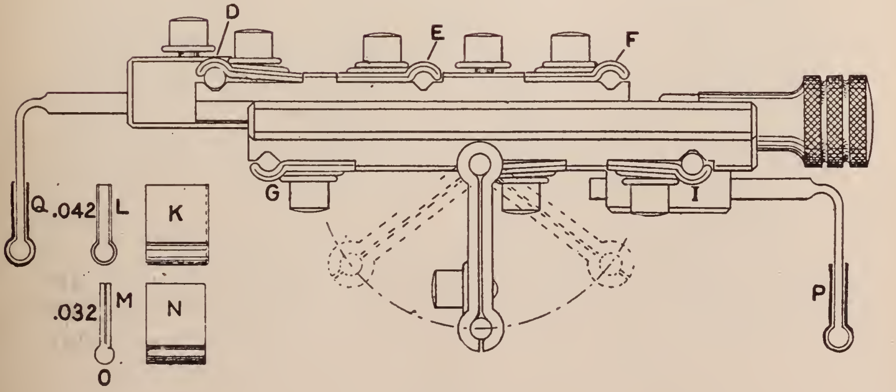

Fig. 10.

the distance between these mandrels will be decreased or increased as the case may be.

Split pins, rendered somewhat eliptical in form made of highly platinized clasp metal and of corresponding diameters, frictionally engage the platinum tubes, and form the retentive part of what is known as the split pin and tube attachment (Fig. 8, D, E, F), used on upper cuspids and centrals and lower cuspids.

Fig. 9 shows the mandrel to be held in the parallelometer for carrying an attachment used on posterior teeth. By virtue of its construction, as seen at A, B and C it is capable of adjustment in horizontal, vertical, and circular directions.

Fig 10 shows the parallelometer holding two of these mandrels, one in clamp D, section A, and one in clamp I, section B.

It also shows a top side view of the platinum hood, K and L. The outside measurements of its width is .042 of an inch, and a top and side view of the plate, or male part of the attachment, M and N. The outside measurements of its width is .032 of an inch.

The male part of this attachment is made of highly platinized clasp metal, keyed at the distal end, O, and is the part of the attachment which is affixed to the bridge, while the hood portion is placed into the crown, or an inlay to be cemented onto or into the tooth acting as the abutment.

P and Q show the manner of slipping the platinum hoods over the mandrels and carrying them into parallel relation to each other, and placing them into the attachments in such relation.

Fig 11 shows A and B, and C and D, the mandrels for carrying what is known as the bucco-lingual attachment, A and B, for molars, C and D for bicuspids.

When there is no pulp involvement of any kind in the teeth which are to be used as piers for a bridge, these bucco-lingual attachments may be used with perfect safety without resorting to pulp extirpation. In such cases cavities are prepared in these teeth and inlays are made for these cavities, and it is onto these inlays that the female parts of these bucco-lingual attachments are secured.

The attachment is .210 and .040 of an inch thick for molars, .150 of an inch wide and .035 of an inch thick for bicuspids, and varies in depth as the linear height of that tooth gingivo-occlus-

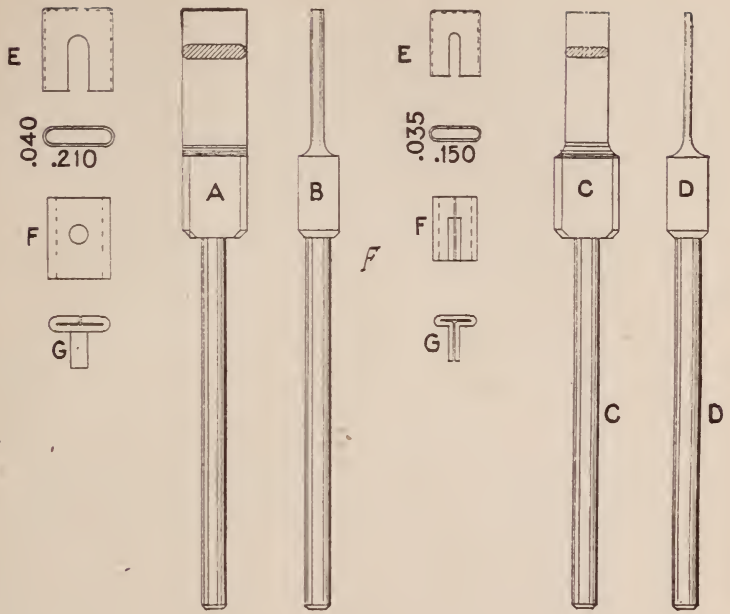

Fig. 11.

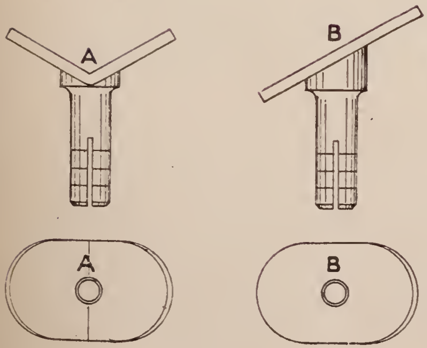

Fig. 12.

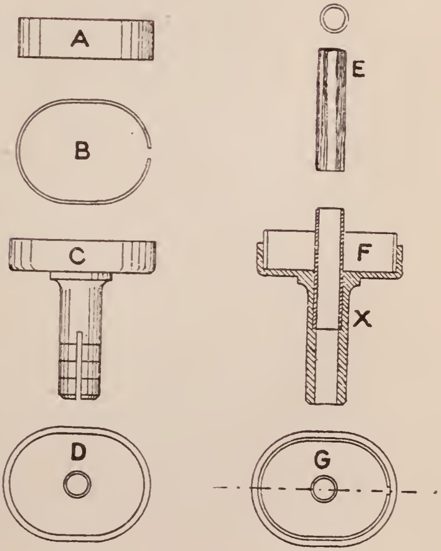

Fig. 13.

ally which is to carry the crown or inlay when it becomes the abutment of a bridge. The attachment consists of a female part or platinum box, E, E, this is slipped on the mandrel, held in the parallelometer and carried to its position upon the model for the bridge. A male part consisting of a double plate of highly platinized clasp metal, F, F which fits into the platinum box, and which plate is to form a part of the bridge.

F, F are mechanical drawings of the male portion of the large and small attachments. G, G are cross sectional views of them.

Upon completion of the bridge, the lingual, buccal, and gingival sides of the male parts are filed to produce an arc of varying degree, the extent of the arc to be determined by the condition of the underlying mucosa. Each one of these sides will touch the straight sides of the box or female part at one point only. We shall thus have an arc tangent to a straight line, which arc will be brought into activity whenever the bridge will be subjected to any lateral stress.

Figs. 12 and 13 show a series of impression trays for co-acting with the mandrels shown in Fig 8. A in Fig. 12 is a tray used to obtain a Taggart wax impression of a root-end.

The tray, made in as many sizes as the number of straight mandrels provided with the parallelometer, is slipped over the mandrel and will frictionally engage any part of the mandrel it may be at. The platinum tube is then slipped upon the mandrel. The tray is brought up to meet the tube, which will enter part way into the friction sleeve.

Taggart wax is then placed directly upon the tray and around the tube. The mandrels, carrying tray, wax and tube, held in the parallelometer, are now placed into the roots, and the trays are forced up so as to bring the wax into the countersunk root-canal and onto the root surface.

B, in Fig. 12, shows a tray used in like manner for obtaining a wax model of a lingual cavity in an anterior tooth, so that a lingual inlay carrying a platinum tube may be constructed.

Fig. 13 presents views of frictional impression cups, which fit over the straight mandrels and serve for taking impressions in plaster or compound, or root caps on anterior roots and platinum tubes in proper relation to each other. A is a view of the split band which forms an inner removable collar in the cup. B is a cross section of this band. C shows the cup and friction sleeve. D the enlarged part of the friction sleeve which is to be partly occupied by the platinum tube. E shows the platinum tube before it slips into the friction sleeve, F is a cross section of cups, removable collar, and platinum tubes stopped at a definite shoulder within the sleeve. G shows the various members, cup, collar sleeve and platinum tube, concentrically arranged. Fig. 14 shows the parallelometer holding one mandrel on clamp D, section A and another mandrel at clamp I, section B.

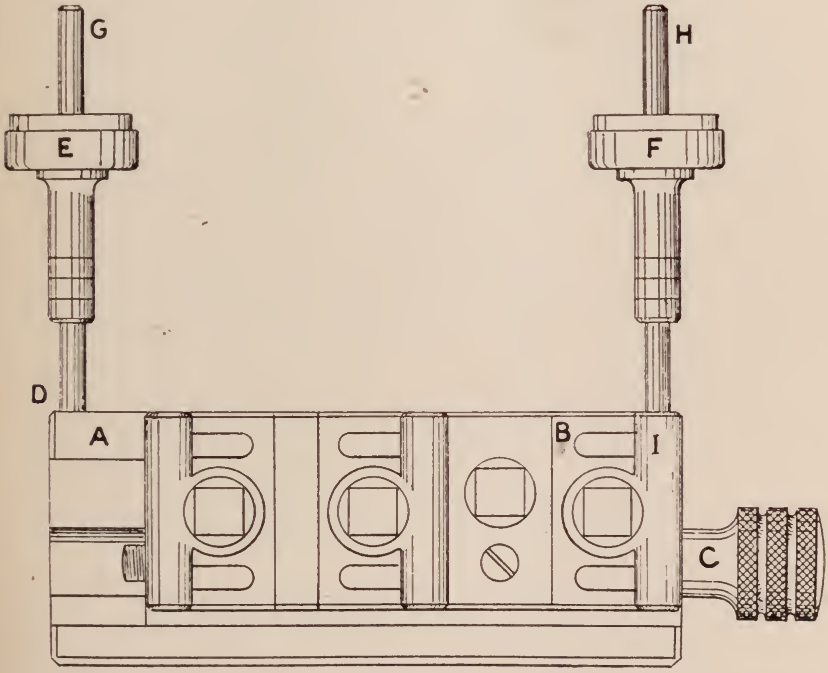

Fig. 14.

Assuming that the canals in two cuspids have been made parallel in a manner to be subsequently described, and assuming that two root caps have been properly made for the two cuspid roots, two friction impression cups are slipped over the mandrels, to be followed by two platinum tubes G and H.

A thin mix of plaster is placed in each cup, and the instrument, carrying mandrels, cups, plaster and tubes is now so placed into the mouth, that the tubes upon the mandrels will enter through the perforated floor of the root caps, upon the roots and slip up into the canals.

The cups are now brought up towards the roots and an impression is obtained of root caps and platinum tubes in proper relation to each other.

When the impression material has set the parallelometer is removed from the mouth, and with it in the little friction cups will come the platinum tubes and root caps.

A mix of refractory compound is made and with a small brush it is painted into the root caps, and around the tubes until a mound of sufficient size has been built up.

When this compound has set, clamps D and I are opened and the body of the instrument removed, leaving the mandrels, cups, and removable collars still with the root caps and tubes imbedded in plaster and refractory material.

The mandrels are carefully turned and brought out.

The cups are pried off and the removable collar will spring apart. The plaster which surrounds the root caps and tube is now in full view.

Graphite points equal in size to the mandrels which have been used are now inserted into the platinum tube and these are joined to the root caps with 22 or 20 karat solder. The soldered caps and tubes are now cooled, cleansed, filed and polished.

The mandrels are reclamped into the parallelometer at clamps D and I respectively.

The platinum tubes and root caps are now mounted upon the mandrels and are to be cemented one at a time in a manner to be outlined in detail in subsequent articles covering specific cases.

If the technique is followed out as directed, it must be apparent that the tubes carrying caps will be perfectly parallel to each other.

Fig. 15 presents at A, the view of an angle mandrel to be used in the parallelometer for placing buccal tubes upon anchor bands in orthodontia cases in such a manner that the expansion or retaining arch may be slipped into position without binding at these points.

B and B, C, D, shows an auxiliary friction tube in the act of engaging a mandrel at C and a clasp metal post at D.

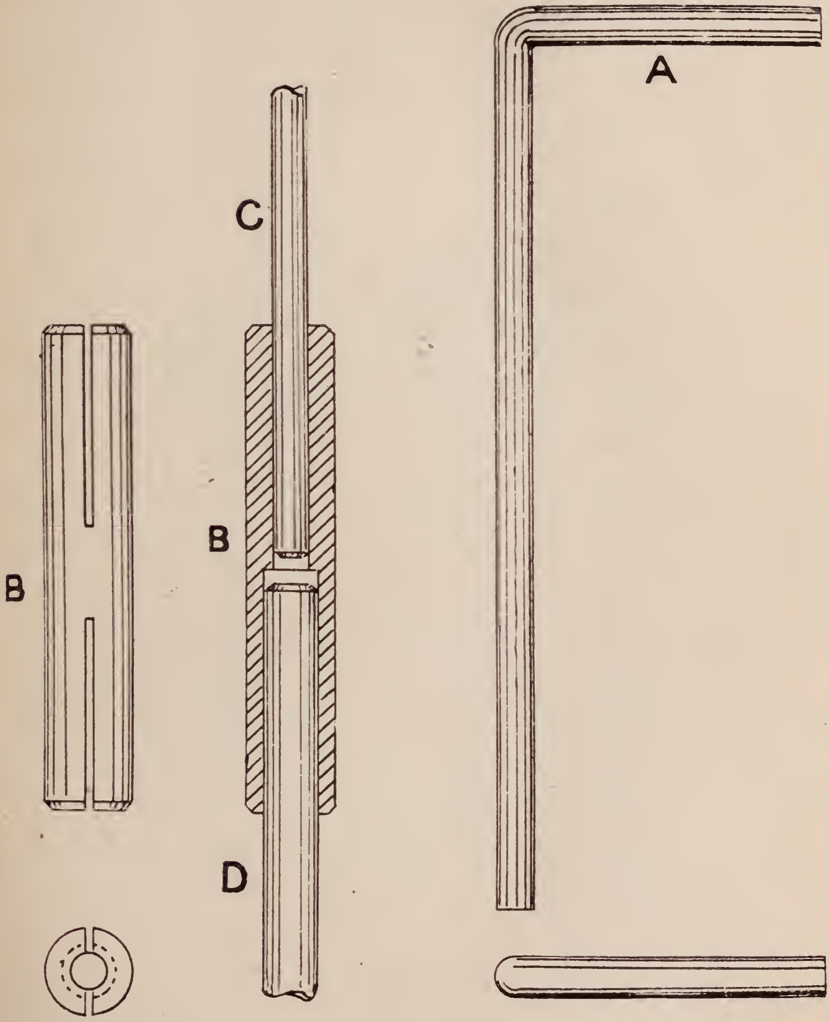

Fig. 15.

The mandrel C would be held in the parallelometer at the clamp any particular case may call for. Another mandrel would be held in another clamp of the meter upon the other section A and B as the case may be. The post D may then be deposited at whatever place it is called for upon the crown or inlay and waxed thereto in perfect parallelism to the other mandrels.

The clamps may then be opened and the meter removed. The mandrel C and auxiliary tube B are now slipped off from the clasp metal post D.

The crown or inlay to which it is waxed may now be imbedded in refractory material and the post and crown or inlay may be joined with solder.

PARALLELODRILL.

Fig. 16 shows the parallelodrill with drill heads 7 mm. apart.

The parallelodrill is a dental engine accessory which cooperates with the parallelometer in such a manner that any linear variation from 7-35 mm. may be transferred from the parallelometer to the parallelodrill.

The latter is then slipped onto the hand piece of the engine, the drills or reamers are inserted and the root canals which are to be paralleled to one another may be reamed out at the same time.

Let us assume that we wish to parallel two cuspid roots and that the ends of the roots have been properly filled.

Two mandrels as shown in figure 8, either 13 or 14 gauge (Brown and Sharpe), as the case may require, are now clamped into clamp D on section A, and clamp I on section B respectively, Fig. 1. The actuating screw C, Fig. 1, is now turned toward the operator when section B is held innermost.

The mandrel at I, Fig. 1, will gradually and with constantly diminishing speed approach the mandrel at D.

From time to time, the two mandrels held in the instrument are brought up to the root canals of the teeth to be used as piers.

When the distance between the two mandrels is equal to the distance between the orifices of the two root canals, so that the mandrels will just enter or be caught in the orifices, the parallelometer is locked by means of a key provided at X, Fig. 1.

The mandrels are now unclamped and two short studs are placed and clamped into the parallelometer in their stead.

The two heads of the parallelodrill are now spread apart so that they will slip over and onto the two pyramidal shaped studs.

The studs will fully engage the two spaces provided in the heads of the drill so that no variation in linear distance is possible.

At this time the distance between the two drill heads of the parallelodrill is fixed by a locking device provided at the centre of the large gear.

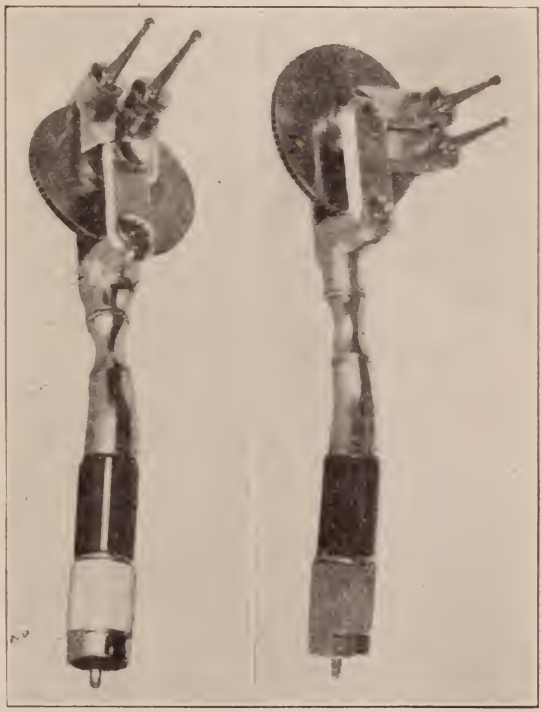

Fig. No. 16. Fig. No. 17.

The studs are unclamped from the parallelometer and then removed from the drill heads.

Two twist drills as much larger in diameter than the mandrels as are the platinum tubes, are now inserted into the drill heads; the parallelodrill is slipped onto the engine handpiece, the power is turned on, and the twist drills are allowed to work their way into the canals of the two cuspid teeth used as piers.

In this manner both canals are reamed out to the size required and they will be parallel, each to the other. The minimum amount of tooth structure is sacrificed, and the physical integrity of the roots is never made doubtful.

Fig. 17 shows the parallelodrill with heads set at an angle of 90° for the purpose of drilling or grinding into two teeth at once. In this position it may be used on the right lower, or left upper jaw. The large gear will effectually hold the tongue out of the way.

Fig. 18 shows the parallelodrill with drill heads 35 mm. apart.

Fig. 19 shows the parallelometer holding the mandrels at the orifice of two cuspid roots.

Fig. 20 shows the parallelodrill holding a twist drill in each head, the twist drill having entered the two roots.

It will be well for all of us to remember this one admonition: It is no good to read anything in a spirit of marked or set antagonism. If we are giving up our time at all, to read a certain thesis it is probably because we feel the need of being enlightened on the subject that the thesis deals with.

A thesis on any technical subject is hardly ever, if ever, written unless the writer feels he has something of value to give to his co-workers, and the mere fact that he labors in this particular field of endeavor and attempts to give what he feels he has to his fellows, entitles him to the mental attitude of receptivity on the part of the reader.

The writer's reward consists in being able to enhance the reader's general or particular knowledge of a subject. The reader's duty it is to place himself in as receptive a mental attitude toward the writer as he can.

The writer is receptive because he, while writing, attempts to discern the mental approach leading most directly to his reader's mind, and tries to so deliver or record what he conceives as true, that it will as nearly as possible be in harmony with the reader's mental processes.

So that in a reflex sort of way, the writer is really the reader or the writer's reflector, his spokesman, his instrument, often voicing or giving crystallized form to innumerable thoughts emanating from the reader's mind.

It may then be hopefully assumed that in their essence, these articles voice what the profession at large feel or know to be true about this subject.

That they have known these things to be true for ever so long and that the writer is fortunate enough to be the favored one, actually influenced by the cumulative thought power of his confreres to the extent of caligraphically recording in concrete form what has for so long existed in the abstract or nebulous feeling.

Fig. No. 18.

Mindful of some previous statements made, it is mandatory that we determine upon a comprehensive understanding of the physiological functions of the organs we are to restore or to replace.

This brings us to the affirmation that teeth have functions (plural, used advisedly); a careful enumeration and a critical classification of these functions are now in order.

We may now record the truth that the so-called masticatory apparatus is not a separate, distinct, and independent part of the human organism, but a functioning multiple member or cog of a very complex microcosm in the maintenance and preservation of which it plays a very important part.

This truth also: the so-called masticatory apparatus is not a simple functioning member of this complex machine, but is in itself a very complex component in that it comprises many organs diversely endowed with specialization.

The thing that suggests itself first in my mind, in regard to tooth function is the reciprocal function of the teeth in that they do something for the organism which does something for them.

Since every organ of the body passively and actively exercises such functions, these may be called the common reciprocal functions and must be classified as the common passive and common active reciprocal functions of the special organs.

The common passive reciprocal functions of the teeth are defensive, cosmetic, developmental, and phonetic.

The defensive C. P. R. F. depends upon the gross anatomy of the teeth, that is that they are so shaped as to prevent injury to the soft tissues surrounding and supporting them.

The cosmetic C. P. R. F. depends upon the gross anatomy, geometric harmony and the biochemistry of the teeth. They must be in harmony with other features of the face and by correct growth influence the other features of the face to harmony, thus also partly exercising the developmental functions.

The phonetic C. P. R. F. depends upon the gross and microscopic anatomy of the teeth and their position relative to each other. That is, they must not only be of a shape and relation conducive to clear enunciation, but also of a texture insuring the proper degree of resonance or vibration, the latter part of this function we can unfortunately not restore by artificial means.

The common active reciprocal functions of the teeth must be further classified into general and special.

The general C. A. R. F. are cardio- or vaso-auxiliary and symptomatic.

The cardio- or vaso-auxiliary C. A. R. F. consists in the restimulating effect which the mobility of the teeth has upon the circulation of the structures in which they sit, and with which they are resiliently joined.

By virtue of this mobility, they induce a rhythmic intermittent pressure which, inimical to end tissue stasis, brings about a constant change of the nutrient elements traversing the nutrient channels of these tissues.

The symptomatic general C. A. R. F. must be sub-divided into structural and positional.

The structural symptomatic general C. A. R. F. must be indicative of some congenital or acquired constitutional anamoly such as (Hutchinson's teeth), thyroidal disbalance, as illustrated in teeth easily attacked by caries, or in the presence of a marked procreative urge often bordering on lack of sexual equilibrium, as illustrated in cuspids or decided prominence and marked prehensile formation reflecting upon the animalistic trend of the individual in whom very frequently are to be also found small suprarenal bodies with narrow cortex demonstrating perhaps a greater procreative and a lesser intellectual mission in the cosmic scheme.

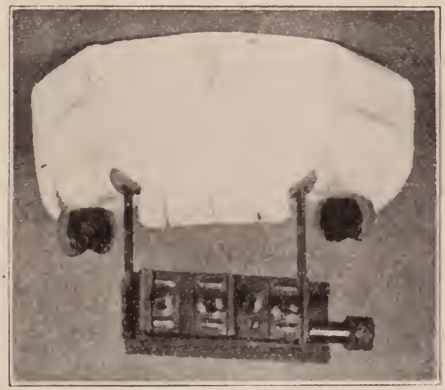

Fig. No. 19.

The positional symptomatic general C. A. R. F. deal with the malposition of different teeth in the maxillae and mandable, and are valuable diagnostic determinators in that they thus unerringly point to pituitary, gounadol and thyroidal disturbances, which would otherwise be most obscure.

The special C. A. R. F. of the teeth are communal and individual.

The communal special C. A. R. F. of the teeth are alimentary and inhibitory.

The alimentary communal special C. A. R. F. consists in the part they all play in the preparation of certain foods for the process of digestion.

The inhibitory communal special C. A. R. F. consists in the physical relationship of the teeth or their relative apposition mesio-distally in particular so as to retard or limit the lateral rotary motion they acquire when in use.

The individual special C. A. R. F. are those of incision, prehension, mastication and trituration, and in the sequence enumerated involve the incisors, cuspids, bicuspids, and molars.

And since all functions are reciprocal there can be no fixed rule or line or demarcation as to where one stops and the other begins.

All these enumerated, classified and dissected, present themselves vividly at some point, the height of the particular functional expression to gracefully and gradually merge or lose themselves in those which follow.

Thus we have an interplay of parts devoid of harsh or interruptive demarcations. A pleasing harmony as expressed in coordinate effort salubrious in effect, a song of work as marvelously planned as it is symphonically expressed in livingness and yet more livingness to the glory of the mind that bade it come into being.

Incision, prehension, mastication or trituration are resultants of opposing forces as expressed in occlusal stresses of upper and lower teeth or rather lower against upper teeth.

The direction in which these stresses are exercised vary in these functions so that it must be definitely understood that the stress which actuates the anterior teeth to incision, is not the same as the one which actuates the bicuspids in their prehenso-triturating function, and that the stress which actuates the molars to trituration is not the same as the one which actuates the other teeth to their particular function, not the same either in intensity or direction.

The stress which resolves itself in incision is exercised in an upward, outward, and backward direction against the upper incisors and results in an opposing stress of downward, inward and forward against the lower incisors or gingivae or intra-alveolar, labio-distally in the upper incisors, and gingival or intra-alveolar, linguo-mesially in the lower incisors.

Upper cuspids are called upon to withstand a stress slightly upward, markedly outward, and equally forward and backward, and that is gingival or intra-alveolar, labio-mesio-distally.

This is balanced by the suspension ligament, the lips, the tongue and the adjoining teeth.

The lower cuspids resist a pressure downward, inward, forward and backward, that is gingivo or intra-alveolar, linguo-mesio-distally.

This is balanced by the suspension ligament, the togue, and the adjoining teeth.

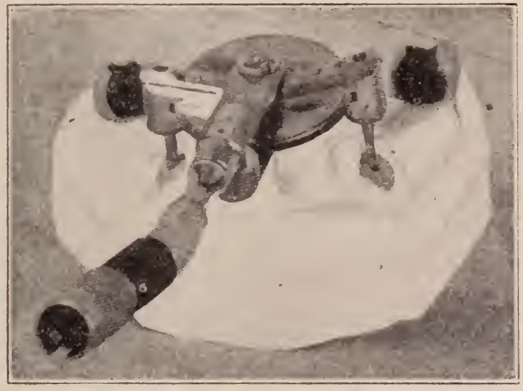

Fig. No. 20.

The upper bicuspids yield to a stress in an intra-alveolar, labio-distal and linguo-mesial. in an upward, outward and backward, and in an inward and forward direction, balanced by the suspension ligament, the cheeks, the tongue and the adjoining teeth.

The lower bicuspids incur a stress markedly downward and inward, minor down, and backward, and in a down and forward direction (outward and backward predominating), or in an intra-alveolar, bucco-distal, bucco-mesial and palato-distal direction, (bucco-distal predominating). Here we see what may be considered a rotary yield to stress or what is more an almost spheroidal yield in the exercise of function balanced by the suspension ligament, the cheeks, the fibres of the buccinator muscles, the tongue, the adjoining teeth, and in the last upper molar by the tuberosity.

The lower molars yield to a functional stress in the following directions: Markedly intra-alveolar, marked intra-bucco-distally and intra-linguo-mesially, minor intra-disto-lingually and mesio-bucally, or markedly downward, marked down and backward, down, in and forward, minor down, back and inward, and down, fore, and outward.

All the foregoing data, regarding stress exercised upon teeth in functions are for teeth in normal or nearly normal occlusion, and with any marked deviation from the normal will, of course, have to come a study of the individual case, and the stresses the teeth may be subjected to when in use.

For the reason that cases requiring restorations known as bridgework rarely if ever present themselves in normal occlusion, study models are absolutely essential to the man who undertakes the case. The architect who expects to build a shack, a bungalow, a cottage, or a sky-scraper has his plans to follow, all figured out to the minutest detail. The engineer who undertakes to build a railroad bed or a bridge knows to a rivet in every joint, just what he is to do. An unforseen emergency arising he is better prepared to meet it properly and successfully, if he had studied his plans, than he would be if he were doing his work in a haphazard empiricism. A brick-layer has his line to follow; a mason his straight edge; a die-maker and his depth-gauge are inseparable; a machinist and his blue prints or patterns are spoken of as one. Study models should be the synonym for dentists and those study models should be made from plaster impressions carefully taken. The casts or models should be carefully made of the hardest workable plastic substance obtainable, and these models should come in for a large share of the dentist's attention.

Each tooth should be carefully examined in the mouth and as carefully on the model. These models must be studied separately and in their relation to one another.

If but one tooth be missing and a restoration is to be undertaken, the care exercised in the examination of the model should be equally thorough as if any number of teeth were involved.

A bridge which involves one side of the mouth is a uni-lateral simple, or uni-lateral compound bridge.

A bridge which involves both sides of the mouth is a bi-lateral complex bridge and it must be remembered that the teeth which are directly concerned in the construction or occlusion of a bridge indirectly influence all the other teeth in the mouth to a more or less limited degree, either favorably when the work has been properly executed, or unfavorably, when the restoration is faulty.

An artificial restoration such as a piece of bridgework can never be modified or in any way influenced by its environment, but on the contrary, it may exercise a powerful influence upon any environment in which it may be placed.

This influence may be a positive, physiologic one, or a positive pathologic one, and it may be partly passive or partly active.

If the restoration has been constructed in full accordance with all the requirements as enumerated and minutely set forth, in the beginning of this article, its influence upon its environment will be constructive, physiologic and restimulating. If in the construction of the appliances, some or all of the requirements have been ignored its influence upon its environment will be pathomorpho-logic, or destructive.

Without at this time going more deeply into the philosophy of the problem, it will suffice to record for future elucidation, that these influences upon environment are active and passive that is, we have active-constructive and active-destructive influences, and we have also passive-constructive and passive-destructive influences.

We must recall that bridgework has been defined, divided and classified into a simple, compound, complex and cantilever, and it should not be difficult to convince ourselves of the truth of the following statements: of all bridges a simple one may be most easily made conducive to the health of the patient.

A compound bridge, presents greater difficulties in the construction than a simple one, and yet both may be so made that their influence upon the patient's health will be wholly physiologic and restimulating.

A complex bridge presents greater difficulties in construction than a compound one and yet it may be so made that it will be conducive to the health of the patient from every point of view. A cantilever bridge presents by far the greatest difficulties in the construction and never can be so made that its environmental influence shall be wholly physiologic.

This comes from the difficulty of limiting the vertical yield of the distal part of such bridges under stress and our inability to halt or arrest this stress before the elastic limit of the subjacent mucosa has been reached.

It is for this reason that the bugbear of resorbtion becomes a vexing factor in these types of restoration, and while it cannot be entirely obviated, it may be limited to a great extent by painstaking attention to occlusion.

The artificial teeth in these bridges must present occlusal surfaces which are exceedingly well defined and capable of dismemberment of food with the least expenditure of muscular effort and hence with but little saddle pressure upon the underlying mucosa. More of this at some future time.

If we now recall the definition of a simple bridge, we can readily see why it should be the least difficult one to so construct that it would be wholly conducive to the health of the patient, and the realization is inevitably brought home to us by the process of association of ideas, that it would be desirable if there were no others, that is if all were simple bridges.

Next to having no need for bridges at all, it would be ideal if we never had any but simple bridges to construct, and since we have bridges we may as well exclude the first condition for the present and accept for our idea that bridge in which the abutments and the artificial substitute are subjected to a stress in the same or very similar direction during the exercise of function.

Forthwith we realize that this is an ideal not possible to reach in a great many cases, particularly the extensive ones and in seeking to approach our ideal as nearly as we may we do the next best thing, we compromise by making the compound, complex, and cantilever bridge as simple as we can, by the method of segregation.

In these instances it simply means the breaking or interrupting of transmission of stress by providing limited mobility at definite points and in definite directions. The mobility provided being as intermittent as the stress of mastication.

In the many years in which bridgework, fixed and for that matter removable, has been practiced, no semblance of standardization has been brought about. This in itself would tend to create a chaotic mutiplicity of methods from which no definite technique could be evolved.

We will do well to carefully consider the reasons for the failure of the fixed bridgework, which we have been practicing.

We must first admit that a great many careful men, good technicians and conscientious operators have practiced fixed bridgework in the past, and if we admit that, we say also in the same breath that these men have practiced carefully root-canal work and have looked well to the cleanliness of the restoration.

They tried the so-called self-cleansing type of bridge and found that wanting; then they made their restoration so that the entire visible anatomy of the missing organ was artificially built up; that too was given up, because too great a surface of mucous tissue was rendered unget-at-able. Then Register came along, and advised the scraping of the cast and the rounded hemispherical seat for all dummies so that this part of the artificial teeth was fairly buried in the soft structures.

With all their efforts, their conscientious work, and careful technique their patients kept coming back and the bridges which these patients carried kept on growing in extent, and expense, and yet they kept right on doing it, hoping against hope that the next bridge would not repeat the performance of the one which went before.

Neither can we truthfully say that these failures all showed lack of occlusal restoration, in a great many cases the reverse is actually the truth. Some of these careful technicians worked diligently and faithfully, and efficiently in producing by means of swedging and grinding, and casting, some occlusal surfaces upon their artificial restorations which left nothing in that direction to be desired, and yet these restorations were a failure, and invariably resulted in the loss of the teeth acting as abutments. Here then we see careful root work, attention to cleanliness, attention to occlusion; honest, careful, diligent effort producing a bridge, a fixed bridge and a failure.

So you see we do not have to go to the faker or charlatan who deliberately deludes the ignorant masses and fills their mouths with work he knows is harmful, but which makes him rich, in order to realize that fixed bridgework is a failure. We need not have infected root canals and their sequellae to produce failures in bridgework, we need not have uncleansable areas in order to produce a failure in fixed bridgework.

There is another reason, a more potent reason, a more applicable reason, in fact, a reason without exception for these failures, and a reason we will no longer be able to ignore, if we wish the public to consider us honest and conscientious.

Fixed bridgework is fundamentally an iniquity, because it does not conform to the fundamental demand of nature. It has no natural prototype. In all the hundreds of thousands of years during which the creative principle has been at work in this world, it has never created a human being whose natural teeth were normally united into one fixed mass. Whenever two or more natural teeth, because of some untoward interruption in normal growth and development were fused into one mass, it became only a question of time as to when the human economy would demand its removal in an unmistakable way.

No amount of denial, no sophistry, no material reasons, economic or otherwise, no biblical quotations will overcome the one evident, biological fact that man has evoluted from helpless inefficiency to present type with a set of thirty-two teeth, each sitting in its own socket upon a resilient cushion and resiliently joined to its surrounding structure, thus enjoying its own particular excursion in functions.

What happens to the muscular tone of a fractured arm in splints and held in a sling during the period of repair? What happens to a leg? or to the thoracic muscular tone where ribs have been fractured and a plaster cast has been placed upon the thorax limiting the mobility of the organs within it and the muscles upon it? and when I speak of muscular tone, I not only refer to the visible course striated muscles upon the surface of the body, but also the unstriated muscles of the viscera, heart, lungs, entire vascular system and intestinal muscular tone. No one with any knowledge of physiology will doubt that permanant interference with motion of the parts named will induce an inhibition of function and that inhibition of function will impair organic integrity. If any of you have any doubt upon the subject, place one of your fingers in splints and leave it in that condition for three or four weeks, do it while you are on your vacation, then remove the splint and note the lameness of the member and its puny appearance compared with the one on the opposite hand. It will convince you that organic integrity and functional activity are reciprocal phenomena, that the former cannot be maintained unless the organs be allowed to express themselves in work.

We know definitely that overwork will induce deleterious effects upon the particular organ which is being overworked. If we bear in mind the overtrained athlete with his impaired cardiac apparatus, the mechanic's thumb, the writer's cramp, the policeman's or the letter carrier's foot, the eyes of the seamstress, the impaired hearing of the boiler makers, as manifested in their tone deafness, one may go on indefinitely showing impairment of organs, which have been called upon to bear an undue stress.

Here then we see in the general ensemble of the body that inhibition of functions, induces states of ill-health, and we also know that intensive function induces states of ill-health.

The teeth are a part of the human economy, a very important part indeed, and the same rules of conservative physiology which applied to the other organs of the body, applies to them. If nature points the way for us, and after hundreds of thousands of years of evolution, presents us with thirty-two distinct dental organs what argument can the puny, human, artificer produce which will justify him in violating this particular institution of the creative principle, with just mere impunity or with his bridgework?

They who practice fixed bridgework, constantly refer to its value as a support for loose teeth affected with so-called pyorrhea, a sort of splint as it were, and here they would perhaps quote the practice of the general surgeon who splints weak or broken bones or joints in order to facilitate repair. But we note that no surgeon every expects to leave any splint on permanently, in fact, he removes the appliances as quickly as possible, realizing that recovery will come the more quickly with resumption of normal function. The dentist also removes the appliance but he usually brings the organs with it.

And what a farce it is to first inflict fixed bridgework upon a patient and by the very fixation of large lateral areas, reduce the normal circulation of the liquor-vitae in the oral structures, thus making it a fit habitat for any bacteria which may be floating around, and then remove this bridgework with the abutments and put in a fixed piece of another sort, to act as a splint for the remaining teeth.

I do not believe that any shell crown should ever be placed upon a tooth unless the pulp has been removed and the root canals of that tooth have been filled. Personally also, I do not believe in shell crowns no matter how carefully made and placed, except under circumstances so rare as to make the quantity negligible. If proper technique is employed, and proper instruments are used it is rarely necessary to extirpate healthy pulp in making the right sort of bridge restorations and this brings us to a quotation of Dr. Thornton, which he read before the Second District Dental Society in New York, a very telling quotation to my mind, and I ask leave to repeat it: "If your bridgework interferes with the mobility of the anchor or pier teeth, your bridgework is inimical to the health of your patient; teeth move in function, and pier teeth must retain the freedom of individual motion in all directions." I want to add to this, the following: that the artificial restoration must go into the edentulous space for which it is intended without exercising any stress whatever upon the teeth or roots acting as piers, and this restoration when in place, and in function must by means of a saddle actuate as large an area of subjacent tissue to rythmic motion as did roots of the teeth which have been replaced by artificial means when these teeth were in position.

Some believe that fixed bridgework should be confined to the anterior part of the mouth, because there it can be readily cleaned. I cannot follow them here, I believe fixed bridgework should be confined to the dead past, to the heap of all other unreasonable methods of practice which were in vogue and very popular during the Spanish inquisition with all its subtle tortures.

Fixed bridgework is bad for any space, in any mouth, under any conditions.

It is bad because fixation is bad. Fixation induces an inhibition of function, an inhibition of circulation and inhibition of that flow of vital essence upon which life itself depends. If the area fixed is small, the damage is small, but it is there never-the-less and I do not want it there.

It is up to the schools. What are they going to do? Are they going to continue to teach these methods of bridgework which have crippled untold thousands, or are they going to display the necessary courage and honesty and revise their curriculum and substitute a real safe, and sane method based upon the recognition of the primary principle that "Teeth move in function," and that artificial restorations must not only never interfere with the movement of pier teeth but must in themselves simulate this motion as required?

I have been pleading for this, since I cliniced in Jamestown in 1907. It is not reasonable to expect the schools to develop and practitioners to practice such a system on a basis that would make it cheap enough for the average wage earner. Very few things are cheap enough for the average wage earner, even ammunition to kill them with is expensive. But why should a system such as this be cheap? Why should not wages be big enough so that any wage earner can afford the sort of work which his well-being demands?

If the world has billions to spend for the slaughter of millions of able bodied men, who never did each other any personal harm, it ought to be able to yield a sufficient amount to the average wage earner so he may properly take care of his health when needs be. That would be simple equity and justice and not charity.

SOME OF THE PRESENT TENDENCIES IN OPERATIVE DENTISTRY.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

In assigning this subject to me your committee probably had in mind the fact that it is well for us at times to take careful stock of our present tendencies to the end that we may get a proper bearing for progress in the future. It seems to me that there never was a time in the history of the profession when matters of greater moment touching the future status of dentistry were up for consideration than now.

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*Read before the sixtieth anniversary of the St. Louis Dental Society, November, 1916.

THE PREVENTION OF DISEASE.

The question of the prevention of dental disease is always of prime importance, and this question has been before the profession in various forms for some time. One feature of it has not, it is true, advanced as rapidly as we could have wished. I refer to the possible control of dental caries by systemic influence, or rather by an influence which shall change mouths from conditions of susceptibility to conditions of immunity. This is in reality a very intricate question, one that demands for its solution a clearing up of another question which necessarily precedes and leads up to it—the question of etiology. Much as has been done on the etiology of dental caries from the earliest time till now we have never yet learned the really significant factor in the pathological process of this disease. In other words we cannot tell why one mouth is susceptible and another immune. Till we know this in a really scientific way we shall never scientifically prevent the disease. It is true that much may be done through the medium known as oral prophylaxis, and yet the question of immunity and susceptibility is not one wholly of hygienic care. If it were we would not be confronted with the spectacle of decay frequently occuring in mouths where good care is given by the patient, and in others of immunity where no care is given whatever. It is only just that this fact should be borne in mind when too extravagant claims are being made as to the efficacy of prophylactic treatment in preventing dental caries. This is not intended in any way to minimize the importance of the most thorough cleanliness on the part of the patient, and attention on the part of the dentist. Very much may be accomplished by proper care not only in controlling decay but particularly in keeping the surrounding structures of the teeth normal. I have always felt that the chief benefit of the practice of oral prophylaxis was to the gums and supporting tissues, and that even this benefit was more or less temporary unless the patient can be induced to give the teeth and gums that daily care which after all seems to me of greater significance in the prevention of disease than any thing the dentist can do.

It is true that when it comes to the removal of hard deposits from the teeth the patient is helpless, and thus it requires the cooperation of the dentist and patient to accomplish the best results. I look upon the removal of all calcific deposits from the teeth as one of the highest functions the dentist can perform, and it is along this line that the profession must more and more increase their efficiency. This topic has been discussed probably more freely than any other, and yet there are so many dentists who utterly fail to do their duty in this respect. The removal of deposits is not so spectacular an operation as the insertion of a filling or a bridge, and it does not accordingly appeal to so many operators. Then again it is so easy to overlook deposits which lie under the gum. If a gum looks normal and no pus can be forced from under it too many dentists take if for granted that nothing is wrong, and frequently go through the process of cleaning the teeth without a thought of what may be hidden under the gum. No teeth should be gone over for the removal of deposits or stains without a careful search with a fine probe under the free margin of the gum around every tooth. Too often even with gums that look quite normal we may find deep pockets beside the teeth and a thin scale of calculus covering the side of the root. There is no more useful service we can render the patient than the careful removal of these deposits and smoothing the surface of the tooth so that reattachment of the pericemental membrance will take place.

This reference has not so much to do with the treatment of pyorrhea alveolaris as with its prevention, and while, as has been said, this work is not so alluring as some other operations in the mouth, yet I know of no more satisfactory service than to take a mouth where the deposits have been neglected, and where the gums are accordingly hypertrophied and engorged with blood, and go over these teeth—a few at a time—and watch the almost miraculous change which occurs following the treatment. It is easy to trace sitting after sitting the exact teeth that have been operated on by the radical change in the condition of the gum, and this should be incentive enough for any operator to encourage him to take up these cases with more scrupulous care, and to impress the patient with the great importance of this work.

Not by any means that he shall do as some are doing—hold out the alluring promise that by taking a prophylactic treatment once a month the patient is rendered immune from dental disease of all kinds. There has been too much humbugging in connection with the practice of oral prophylaxis. Let us be honest with the patient as well as with ourselves. Let us acknowledge that with all of the splendid results we may obtain by keeping the teeth carefully cleaned, with the demonstrated minimizing of dental disease following this practice, and with the great value to the patient as a hygienic measure, there is still the possibility of disease occurring in spite of this treatment in some cases; and there are certain mouths in which you may go over the teeth as thoroughly as you wish and polish the enamel until it glistens like glass, and do this as often as once a month and yet meanwhile those teeth will coat up with deposits and take on stains as if no attention were ever given them. Contrast a mouth like this with one in which the condition of the enamel is bright and satisfactory even without any care on the part of the patient, and it brings us inevitably back to a recognition of the fact that there is something fundamentally different in the conditions existing in different mouths which affect this matter of deposits as well as the question of caries of the teeth. I venture the assertion that if Dr. G. V. Black had lived a few years longer we would have known more about this matter of immunity and susceptibility, and my great hope is that the Research Commission of the National Dental Association will follow up the work along this line to a successful conclusion. To this end every member of the profession should support the efforts of this commission by liberal contributions of money, and in no less a degree by the strongest and most enthusiastic moral encouragement.

Meanwhile the best we can do for our patients in the prevention of disease is to keep the mouth and teeth hygienically clean, and see that the function of mastication is maintained with comfort and satisfaction to the patient. Without this function adequately performed there is no assurance of freedom from disease no matter what kind of prophylaxis is performed, and this question of the maintenance of mastication is worthy of a somewhat extended consideration in connection with this subject. It relates to the occlusal surfaces of teeth and fillings, and particularly to the form of the proximal contacts between teeth—a question which I have recently discussed in some detail before other societies, and which must therefore be passed with a mere mention at this time. Suffice it to say that no mouth can ever be very long free from either caries or pyorrhea in which the contact points are such that fibrous food constantly leaks between the teeth and lodges there. I look upon this question more and more as most important in the maintenance of oral health, and I fervently wish we might rouse the profession to a realization of its great significance.

FILLING MATERIALS.

In a consideration of operative dentistry the subject of filling materials is always of more than a passing interest. Of late little that is new has been added to the literature of the subject, and in a practical way the most outstanding development seems to be the growing importance of the silicate cements. The constant improvement in these materials seems to be forcing them upon the attention of the profession more and more, till, within certain well recognized limits, they may be classed as a distinct and important addition to our list of legitimate filling materials. Their great improvement in appearance over any other kind of filling material in use compensates in certain locations in the mouth for the fact that they must still be classed as more or less temporary in character. With the development of esthetics in connection with our work it will no longer do to ignore the great virtue of any material which has the quality of blending well with the natural enamel, and if the silicates are skilfully manipulated they will do this more perfectly than will any other material ever presented to the profession, not even excepting the porcelain inlay. With a proper recognition of their limitations the silicates will prove a very acceptable adjunct to our filling armamentarium, and we may confidently look for even a greater improvement in their manufacture in the future, to the end that they may be more permanent.

FOCAL INFECTIONS ASSOCIATED WITH THE TEETH.

Probably the one subject more prominently before the profession than any other at the present time is the one of metastatic infection connected with pulpless teeth, and in view of the keen interest manifested in this subject it is my desire to discuss it in the most careful manner and from the broadest possible point of view. No dentist of any experience and observation will deny the far-reaching effect of mouth conditions on the health of the individual. Ever since I can remember anything in dentistry I can remember the constant warning of our dental writers against permitting infections in the mouth to go unheeded. The grave danger of infecting the alimentary tract through the medium of pus generated in the mouth, either from alveolar abscesses or pyorrhea pockets, or of involving the lungs through breathing, or of being carried into the circulation through the blood streams has long been heralded by dentists. Certain members of the medical profession also have recognized this fact and have made it a requisite of their patients who were suffering from chronic disorders that they must go to their dentist and have the mouth put in a healthy condition. I recall at least fifteen years ago a trained nurse coming into my office and asking that an alveolar abscess in her mouth be cured, saying that the surgeon whom she assisted in his operations refused to have her in the operating room till this pus focus was obliterated. I have always had a great deal of respect for that surgeon.

But there were many in the medical profession who failed to recognize the true significance of mouth conditions on the general system. Speaking of sepsis in the mouth, Dr. John S. Marshall in a recent paper entitled "Septic Teeth," *(Pacific Dental Gazette,* August, 1916) says: "Dental surgeons have been trying for years to impress this fact upon their patients, and upon the medical profession generally, but their efforts have usually fallen upon indifferent or deaf ears. With a few notable exceptions they have, until quite recently, made but few converts among medical men. These gentlemen have, as a rule, looked askance at any opinion upon a medical or surgical subject coming from a dental surgeon; saying in some instances that it would be better 'the shoemaker should stick to his last!' This attitude has doubtless retarded an earlier and more just conception of oral sepsis as an ever-present menace to individual health."

In 1900 and 1901 Dr. William Hunter of London, England, called the attention of the medical profession to the significance of oral sepsis in a very valuable communication to the *London Prac-*

titioner and in a monograph. Later in 1911 (*London Lancet*), he made a very sweeping condemnation of many of the dental operations performed today, notably crown and bridge-work, as being contributing factors leading to these conditions of sepsis. The effect on the dental profession of Dr. Hunter's criticism of dental operations was peculiar. Some of the profession of America resented his strictures on account of his apparently unjust bias in singling out the so-called "American Dentistry" as chiefly to be blamed for this condition of affairs. Others from time to time since his utterance have quoted him as being well within the mark, and have heralded him as a deliverer from the dangers which we as a profession were inflicting upon an unsuspecting public. This meek submission to so drastic and general a condemnation as Dr. Hunter heaped upon the dental profession has, I confess, grown to me a trifle irksome. I am somewhat weary of sitting time after time in a dental gathering and seeing men meekly submit with bowed heads to an endorsement of Hunter's attack on dentistry without raising a word of protest in our defense. The fact is that no general and sweeping statement of men or methods is often wholly correct, and while I am the first to admit that much bad and harmful dentistry has been done in the name of crown and bridge-work, yet I must insist that there is very much of it that is not only not harmful, but that is proving a very important factor in the maintenance of health and longevity in the people. Too many men are devoting their best energies to making restorations in the mouth that shall be sanitary and serviceable to justify us in longer submitting to so general a condemnation without discrimination.

As Dr. Marshall says in the article before quoted: "The difficulty with Dr. Hunter's criticism was that he arraigned the whole profession, for he made no distinction between the honest, scientific dentistry performed by the better class of practitioners, and the dishonest, unscientific slovenly dentistry practiced by the quacks.

"What he said about the latter was eminently true and just; but when applied to the honorable, conscientious dentist was eminently untrue and unjust, as every fair-minded medical practitioner must admit. It was this criticism which has been taken up by many medical men without proper investigation, that has brought about this desire for the wholesale extraction of all diseased teeth, regardless of the possibility or the probability of being rendered healthy and indefinitely useful by proper dental treatment."

And yet the "wholesale extraction" cannot all be attributed to Dr. Hunter's articles. There has since then developed an entirely new phase to the question and it is this which, at the present time, is so prominently before the profession. In November, 1912, Dr. Wilbur E. Post read a paper before the Chicago Dental Society on "Oral Infection in Relation to Systemic Disease." This paper was discussed by Dr. Frank Billings, Dr. Edward C. Rosenow, and Dr. D. J. Davis. These men were all medical practitioners, and the society felt highly honored by their presence. The paper and discussion were published in the February, 1913, number of the Dental Review, and they make out a very clear statement, presented in a conservative and logical manner, of the possible systemic trouble arising from foci of infection in the mouth. Since then various papers have been presented on this subject, and the attention of the medical profession has at last become focused on the teeth as causative factors in many of the diseases to which flesh is heir. In fact the long-standing plea of the dental profession that medical men should recognize the teeth as most important in health and disease has been more than met. They have "seen us and gone us one better," till today it is hard to enumerate a disease in the whole category that has not by some one been attributed to the teeth.

Dr. Billings, in the discussion of Dr. Post's paper, gave warning about this very thing. He called attention to the fact that there were many other foci of infection in the body aside from septic teeth, and that because a patient had arthritis, myocarditis, anemia, etc., the conclusion must not be jumped at that the teeth were necessarily at fault. But this is the very thing that is being done today by too many practitioners. The teeth are made the scapegoat for all the ills of humanity, and are being sacrificed in an altogether unwarranted manner.

Let us examine this question with an eye single to the welfare of the patient with our faces turned toward the light, and see what it reveals. There is enough menace from diseased teeth to give us pause, and make us look carefully into the merits of each case presented for our consideration. It will not do to blink our duty in the slightest degree. The dental profession must co-operate in the heartiest manner with the medical profession in clearing up these infections. Teeth which are demonstrated to be diseased and which cannot be made normal by treatment should be extracted. There should be no equivocation or compromise on this point, and the dentist who shirks the issue in these cases is failing in his bounden duty to the patient, even to the extent in some instances of placing the life of his patient in jeopardy.

But there is one phase of this question which should at this time be considered with the utmost frankness. It should be approached "with charity for all and with malice toward none," with the sole idea of arriving at the truth, and then abiding by the truth when it is found. It has been determined that one of the most dangerous forms of infection connected with the teeth was not after all the variety of infection referred to by Dr. Hunter, but the infection found at the root ends of pulpless teeth—a form of infection hidden from sight, with no external sinus opening, and in many instances wholly unsuspected by the patient and by the dentist. When this variety of infection began to be recognized there was only one possible way to detect it, and that was by the use of the X-Ray. For purposes of diagnosis the X-Ray has proved itself to be one of the most valuable aids the dentist has ever found. It has thrown light on many obscure cases, and has aided in revealing many infective foci which without its use could not have been demonstrated. But it has also been the medium through which much erroneous diagnosis has been made, and many unwarranted conclusions have been reached. When the insistant demand arose for X-Ray pictures many men devoted themselves exclusively to making radiographs, and these men have been of inestimable service to the profession. But with the rest of the world they are human, and they instantly began to read things into X-Ray pictures that were not there. The slightest shadow at a root end was pronounced on "abscess" or an "infection," and the tooth was instantly condemned to extraction.

This is the way it worked out in practice. A patient would become ill if some affection, sometimes grave and serious, sometimes vague and indefinite—merely not feeling up to par—and at other times wholly imaginary. The patient would consult a physician, and this being the medical era of teeth, these organs were at once suspected. The services of the X-ray man were enlisted, and it was a very wonderful mouth in which he could not demonstrate some form of infection. It might be an "abscess at a root end," it might be an "area of infection" or it might be "pyorrhea." Any of these terms sounded formidable enough to the patient and when this was the verdict of the radiographer, backed up by instruction from the physician to go and have the teeth taken out, it was a short route to the extraction specialist. In all of this procedure there was one individual who was apparently never thought of, and that was the family dentist—unless perchance the patient after sober reflection concluded that it might be well to consult him.

And after all there is a very natural reason why this should be so, and the dentist must not be too sensitive about it. The natural thing when a patient is ill is to consult the physician, the natural thing for the physician is to look at once for the cause of the ailment, and the other natural thing is to have the cause removed. In the past there has not been sufficient community of sentiment between medicine and dentistry to make the practitioner of either calling consider carefully enough the point of view of the other; but fortunately this is rapidly passing away, and as a result the people are to be better served. The natural consequence of the procedure just alluded to has been the extraction of many valuable teeth, and in some instances the serious crippling of the patient for mastication, leaving the individual in a much worse condition than he was before treatment.

There is a lesson in all of this for the physician, the radiographer, and the dentist. The physician should learn that the dentist in all modesty knows more about teeth than he does, that all diseased teeth are not incurable; that all pulpless teeth are not diseased, that the teeth do not cause all the ailments to which human flesh is heir; that the loss of a healthy tooth is a more serious matter than he can imagine, and that in some instances it may really interfere with the comfort and even the health of the patient; and that he should not pass judgment on teeth without consultation.

The radiographer should learn that conservative statement is a jewel of great price; that every shadow at a root end is not necessarily an infection; that it is not within his power to determine by X-Ray alone whether many of the clouded areas at root ends are active abscesses or merely areas where abscesses have been, but where the tissue has healed and is doing no injury whatever; that X-Ray pictures do not always show infection when it is there; that in short radiographs should not be looked upon as infallible, and that the evidence presented by them should invariably be considered in connection with the most careful clinical observation.

And the dentist has a lesson to learn if possible more exacting and important than either of these. He must learn that infection in the mouth is a serious matter; that it is his duty to search for it and to clear it up when found; that because the external appearance of a mouth seems satisfactory it is no evidence that there may not be hidden trouble; that he must counsel willingly at all times with the radiographer and physician, in diagnosing obscure maladies among his patients; that he must cooperate with the physician most heartily and cordially in eliminating foci of infection in the mouth; that he must improve his technical operations to the end that fewer infective processes shall follow them; that he shall think only and all the time of the physical and mental welfare of his patients; and then having fortified himself with the conviction that he has faithfully done all of this, he must have the superb courage to stand out in the face of the physician, the radiographer and the public, and protest with all of his soul against the unwarranted mutilation of the human mouth that is going on in too many quarters at the present time.

THOUGHTS ON MODERN DENTISTRY.*

BY SYDNEY J. KNOWLES, D. D. S., CHICAGO, ILL.

We see and hear so much regarding the foci of infection in the mouths and jaws, it seems to me it is our duty as progressive men, to not only do all we can to eliminate such dangerous conditions, but what is far more important and scientific, take all steps possible to prevent them.

Of course, you have all read and heard a great deal about the systemic reactions due to infections, the foci of which are assumed to occur in and about the mouth, jaws and head. Any fermentation or infection undoubtedly has an effect on the general system, varying in degree to the amount and virulency of the micro-organism and the blood resisting power of the particular individual.

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*Read before the Odontological Society of Chicago, Dec. 5, 1916.

What I hope to convey to you tonight is what I believe to be just one of the many specific sources of infection that may be eliminated, and more particularly prevented.

We are told and know that the non-hemalizing streptococcus viridans under many conditions is ordinarily a mildly infectious micro-organism having a low degree of virulency. It is said to be generally found present and lying dormant, in the mouth, nasal cavities and upper air passages of the pharynx in apparently perfectly healthy and normal human beings. The retention and confinement of this same organism in a favorable and suitable environment may change it so that it becomes actively virulent and dangerous to the human being. The point I am trying to bring out is this, that if a mouth is so kept that there are no lodging places in it to retain this or other organisms, we have naturally reduced one of the opportunities for a change from a non-virulent organism to one becoming virulent and a menace to the health of human beings.

I sincerely believe we are all very much absorbed and especially interested in this day and age of the more progressive and scientific treatment of all dental lesions. In order to emphasize what I am leading up to I know I shall be referring to many points you are now very familiar with. I beg your indulgence if I am repeating too many old facts.

It has been a very much argued question, as to whether the lesions of the mouth were due to diseased systemic conditions, or that the systemic conditions were due to pathological lesions of the mouth. On this point a very interesting and scientific paper was presented before this society last December on Diabetes and its relationship to dental lesions. After some considerable reading and observation I am more strongly inclined to the opinion that it is more possible and probable for systemic lesions to emanate from diseased conditions in the mouth and from diseased teeth, than to contend the lesions of the mouth are the result of systemic disorders. I am firmly convinced you will all agree with me that the proper scientific diagnosis of diseases dental or otherwise is of course first in importance, and the correction or elimination of the cause becoming a secondary consideration.

It is my intention tonight to dwell particularly on one specific source of trouble or conditions, that is primarily the result of a mechanical irritation, causing the subsequent pathological conditions with its many destructive results, both local and systemic. The effect of mechanical irritation of salivary calculus and over hanging edges of fillings with certain pathological results has been discussed many times before. Primarily, the object of my attack or rather discussion, is the banded, gold shell crown, but any banded crown may be included.

The shoulder usually formed by an over hanging filling or the projecting edge of a banded crown does afford a lodging place for a mouth debris and micro-organisms, that may possibly do serious harm. I think the damage done will vary as I have said before, to the amount and nature of fermentation and suppuration going on which is controlled by the ability of the individual to form a resistance to it in the nature of anti-bodies in the blood.

I shall show you a number of radiographs of teeth crowned with banded crowns that have characteristic over hanging edges. The damaging results of such crowns on the alveolar process and surrounding tissues show in the amount of bone absorption due, I contend, to the retention of effete fermenting and decaying material with the unquestionable absorption of toxins and poisons into the general system. Owing to my observation of the diseased and pathological conditions so often resulting from banded crowns, it has been my practice for the last nine years to use practically no banded crowns at all, during which time I have been able to substitute a bandless crown, which to me has proven far more satisfactory.

In the incisors and bicuspids it is possible in most instances to very easily and satisfactorily adapt a thin piece of gold or platinum directly to the roots, but in all the molars presenting very irregular surfaces, and most of them do, it is usually very difficult in the mouth to properly fit a metal coping directly to the root.

A method and the technique for perfectly fitting or adapting metal well re-inforced to the surfaces of an irregular molar root is to be my contribution to you at this meeting. The models I have here will help me to demonstrate more thoroughly many of the little details in the work. I shall attempt to describe the technique of crowning a badly broken down molar, which by many men would ordinarily be crowned with a gold shell crown. If not enough tooth structure is left to satisfactorily restore such a tooth with a gold inlay I would grind the remaining pieces of tooth down to, or slightly below the gum margin, then prepare the root canals for 16 or 18 gauge square iridio-platinum posts. (Assuming of course that the root canal apices have previously been properly filled and sealed). An impression is taken of the root by first packing the prepared root canals with cotton to prevent impression materials from forcing into them, using a cube of Kerr's Detroit modelling compound which is slightly larger than the root outline. Soften a thin layer of the compound on the surface, using a flame. The compound cube if pressed over the root and held firmly in place and chilled with ice water will usually result in a very perfect impression, showing a well defined outline of the root. The writer has found this method better than any of the band matrix methods for obtaining an impression and very much easier on the gums and soft tissues of the patient.

Having secured a good impression the entire work of making the metal cope is done in the laboratory on a cement model obtained from the impression. Imbedding the compound impression in a small pad of plaster to support it; when plaster hardens a putty like mixture of Ames' brown crown and bridge cement rolled in talcum powder is firmly forced with one's fingers down over the impression, using a great deal of pressure. The cement and impression are immediately placed in tepid water to assist the proper setting of cement and when hard, model is separated from impression by heating in hot water. The cement model is imbedded in plaster held in a metal tray that will fit a Brewster rubber plunger swaging machine.

The model obtained, the first step is the swaging of a piece of platinum foil 1/1,000 of an inch thick to the model of root leaving a surplus of about ⅛ of an inch. The next step is to swage another or second piece of platinum 1/1,000 of an inch on top of the first and trimmed to overlap only $\frac{1}{16}$ of an inch. On top of the two layers of platinum foil 36 gauge pure patinum plate is swaged and trimmed to exactly the root outline, by painting a liquid borax between each layer of metal it is usually a very simple matter, using platinum solder to perfectly solder the three layers together, thereby strongly reinforcing them, the surplus of the platinum foil trimmed and disked off, which gives you a strong and rigid metal covering for the end of the root.

By this method, I am sure, that it is possible to obtain a very perfectly adapted coping and one that is rigid enough to prevent distortion in the subsequent handling in the fusing and building on the porcelain top. A maximum strength with a minimum amount of metal is procured with a cope made this way, for there are two layers of 1/1,000 platinum foil, one layer 36 gauge platinum and two layers of platinum solder.

In concluding these few thoughts I want to add that I believe every effort possible ought to be made to avoid all conditions likely to bring about a lowered resistance of tissues.

The conscientious and intelligent preservation of the dental pulp and the most aseptic surgical removal of same when absolutely necessary with a painstaken root canal filling technique following will do a great deal towards Prevention.

Skillful prophylactic treatment is also a very important factor.

The subject I have presented is but one of the many problems we are confronted with, and I trust, I have impressed its importance.

DENTAL RADIOGRAPHY AS APPLIED TO MODERN DENTISTRY.*

BY FLOYD D. LEACH, D. D. S., CHICAGO.

Mr. President, Members of the Northern Illinois Dental Society, Ladies and Gentlemen:—

The history of the X-ray dates back to July 1895, and a paper dealing with Dental Radiography would be lacking did it not include at least a short resumé of the evolution of this work.

Those members of this organization who have been allied with the profession for the past twenty-one years will no doubt remember the startling announcement, which was flashed across the Atlantic, stating that a wonderful agent, developed by certain electrical and vacuum manipulations, had been discovered.

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*Read before the Northern Illinois Dental Society, October, 1916.

It was almost beyond reason to believe that so powerful a light wave or emanation could be produced that would travel at such a tremendous rate of speed as to actually penetrate and pass through an opaque body. But such was the case.

Prof. William Conrad Röentgen, of the University of Wurtzburg, Germany, was the lucky scientist who, by his study and ingenuity assisted by a trick of fate, was able to give to the world this marvelous aid to diagnosis and surgery.

When leaving his laboratory one evening he noticed, after switching off the lights, that a sheet of cardboard coated with a calcium salt seemed to glow or fluoresce. Upon investigating he found that he had forgotten to turn off the current from a generator and high vacuum tube with which he had been experimenting. For some reason or other he held this cardboard nearer the excited tube and it lighted up more brilliantly, and as he was watching this peculiar phenomenon he was greatly surprised to note the shadows of his fingers outlined quite clearly upon the cardboard.

Experiment after experiment he performed and finally succeeded in recording upon a photographic plate the shadowgraph of his hand. Thus it was that a mere accident together with an intelligence capable of grasping the idea made known to the world this astounding discovery.

Immediately upon the announcement of this new ray, scientists in Europe and this country started delving into its mysteries, and just to show you progressiveness, the American Dentist, as early as September, 1895, Drs. C. Edmund Kells, Jr., and William J. Morton of New York, began working in the field of Dental Radiography, demonstrating before several of our societies the making of shadowgraphs of the teeth in situ in the mandible and maxilla. As our science and knowledge has advanced, so have the needs and uses of the radiograph increased until today the laity, as well as those of the profession, are demanding that it be employed in everyday practice as well as in the more difficult and obscure surgical cases. Even the courts of this country are holding that unless a practitioner uses to the best of his ability and teaching the up-to-date devices and aids for safeguarding the welfare of those who come under his care, in cases of suit for malpractice, something more than just a severe reprimand or judgment will be administered. In just this one phase of the subject the radiograph, if properly applied and interpreted, might be a saving grace or weigh heavily on the other side of the scales of justice.

The radiograph should be applied to all branches of our science, not as a novelty or something out of the ordinary, but as a routine, everyday procedure in the form of a complete mouth examination before the work is commenced. In so doing one would not only have a complete record of operations which had been previously performed, but the conditions about the roots of the teeth at the time of beginning work on the case would be as an open book, and thus eliminate at least fifty per cent of this guessing game which we call root canal work. As a general rule a contractor does not lay the foundation for a building unless he first has a set of plans from the architect, and a very accurate survey of the ground made by some competent engineer.

We as dentists have no right to propose procedures, especially certain root canal operations, without first having our blue prints and knowing how to read them. This *modus operandi* will certainly lead to better dentistry and a healthier clientele. The installation of a radiographic equipment in every dental practice is not encouraged, as the sequellae might be dangerous not only to the operator but perhaps to patients as well, and at best the results might be only mediocre.

Let one thorough operator in a community, who has had some electrical training as well as his professional education, take it upon himself to become the radiographer for a certain territory. Let this man study and perfect himself, to his greatest ability and ingenuity, in this particular line and you will find that the results will be uniform and standardized; that is, if he is enthusiastic and serious in the work and has provided himself with the proper equipment.

Each dentist must review carefully his dental anatomy, histology, physiology, pathology and nomenclature, for upon these things depends the intelligent interpretation of the film. The clinical findings make for at least fifty per cent efficient diagnosis, and each case must be studied carefully from this point of view in order that an errorless summing up may be arrived at.

Now as to the reading of the dental film. It must be remembered that it is a shadow picture and that all shadows, no matter from what source derived, are more or less distorted. Anatomical arrangement and delicate structures make this more pronounced in the mouth than in any other part of the body, thus necessitating a very careful technique of placement and exposure. Furthermore, the everyday dental radiograph has no perspective; that is, it is a flat reproduction, depicting as the cut surface of a longitudinal section of the area only. However, we have in the past few months developed a method whereby we can show a certain amount of depth of structure by working out a stereoscopic set of the region, the films being viewed through an ordinary stereoscope. If asked for, the technique will be explained in closing the discussion, a few sets being presented for examination.

The localizing of unerupted teeth is fairly easy to arrive at, for as a general rule the sharper the outline of the shadow the nearer the object is to the sensitized surface of the film.

Pathological conditions about the apices of roots are more difficult to shadow, and as a general rule two or three exposures should be made in order to be more certain as to the extent of the destruction.

It might be well to state at this point that not all dark shadows about these root ends can be called true abscesses. The shadow may be a large foramen in the bone, such as the mental or anterior palatine which has been projected and superimposed over the apex of the root. It may be an infected area, it may be a sterile granuloma, or small spaces filled with fibrous tissue, or a perfectly harmless physiological exudate. To be sure, in the three latter instances the end of the root down to a point where the fibers of the peridental membrane is attached must be considered as more or less a foreign body, and always an irritant causing a lowered resistance of the neighboring tissues, thus laying them open for the ingress of infections.

In cases of so-called pyorrhea the radiograph is rendering efficient service, enabling the dentist to see to what extent the destruction has progressed, and where the lesions are located favorably in line of the ray, showing up the deposits of serumal and salivary calculae.

Orthodontic procedures are aided greatly by the dental film used as a guide to proper placement of appliances, and to watch the progress of the case from time to time; also, as a final record to be compared with the previous examinations.

In the departments of operative and prosthetic dentistry it is needless to further enunciate the many advantages of this helpful agent, for without it our root canal procedures amount to more or less of a gamble and place the burden almost entirely upon the patient. One could almost say, laying the blame for faulty root treatment and filling at the door of the human because of the simple reason that he *has* teeth.

However, the dental radiograph has a great office to perform as an aid to our work, and when abutted with our own best efforts and untiring perseverance will save many a sleepless night for both patient and conscientious dentist, thus by its application to our dental science and technique, help us in promulgating a more robust and intelligent people.

OPERATIVE AND POST-OPERATIVE TREATMENT FOR THE REMOVAL OF IMPACTED THIRD MOLARS.

BY WALTER G. MC GAULEY, D. D. S., BOSTON, MASS.
(Dental Surgeon to Boston Free Home for Consumptives.)

Third molars generally erupt between the ages of eighteen and twenty-five, but a few cases are on record where they have not appeared until the age of forty. Their appearance gives rise to little or no disturbance provided the development of the jaws is normal and the path of eruption is not obstructed. When the above is contrary and teeth fail to erupt, serious results may follow. A tooth is said to be impacted when its eruption is partially or wholly obstructed by bone or by some other tooth. The teeth most frequently impacted are the lower third molars. Many theories are advanced as to the etiology of impacted third molars, but the one advanced by Brophy is most excellent. He says, "In the development of the mandible the first permanent molar is developed in the body of the bone about the sixth year a little anterior to the ramus. As the body of the bone lengthens in its development, the second molar also appears just posterior to the first molar and in front of the ramus. The body lengthening still more in its growth, the third molar erupts posterior to the second, and directly in front of ramus.

If, however, the body of the bone fails to lengthen sufficiently to admit of the normal eruption of the third molar, it may take a position with its occluding surface directly in contact with the posterior surface of the second molar, while its roots extend upward into the ramus of the bone. The tooth thus lies in a horizontal position, nearly, or quite parallel to the lower border of the bone (as in X-Ray below, Fig. 1). A tooth in such a position may cause extreme discomfort by reason of pressure directly upon the third or mandibular branch of the fifth nerve. It may readily be seen that the root ends of a tooth may come in direct contact with this large nerve and thus cause neuralgia. It may by reason of its

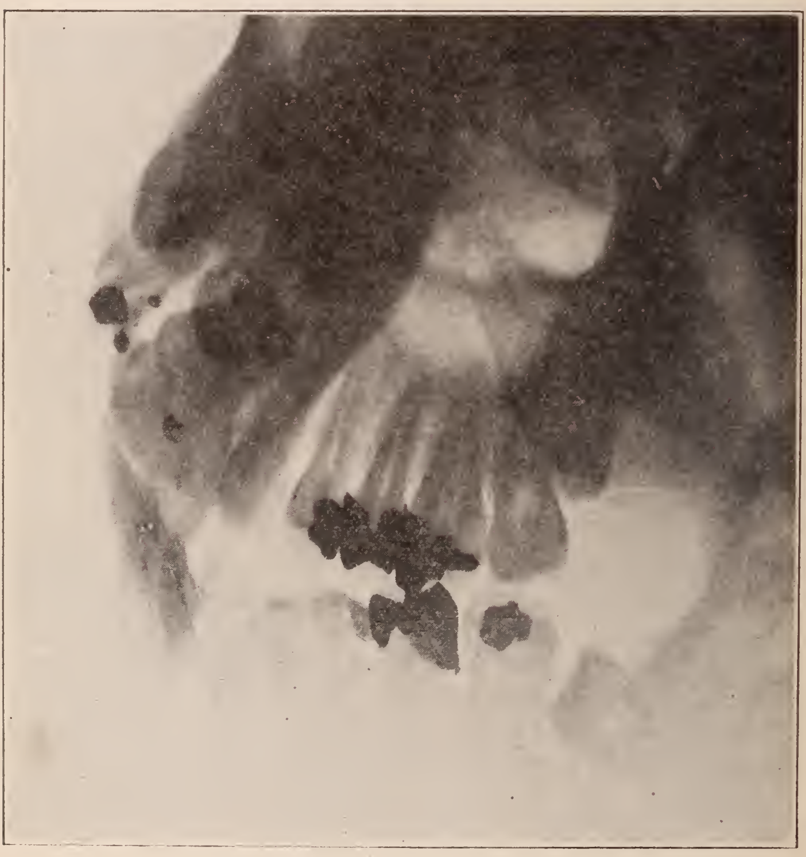

Fig. 1.

pressure, cause extreme swelling involving the surrounding soft parts."

The cardinal symptoms of impacted third molars are, rapid rise in temperature, a foul odor of the breath, the patient is unable to move the jaw in some directions without considerable pain, the jaw may become fixed and immovable, deglutition is very painful, and there is swelling around the area involved. These symptoms, if left alone and untreated, tend to give rise to severe pain and discomfort, and inflammation results. Pus may then readily enter the lymphatic pathways of the neck burrowing along the lines of

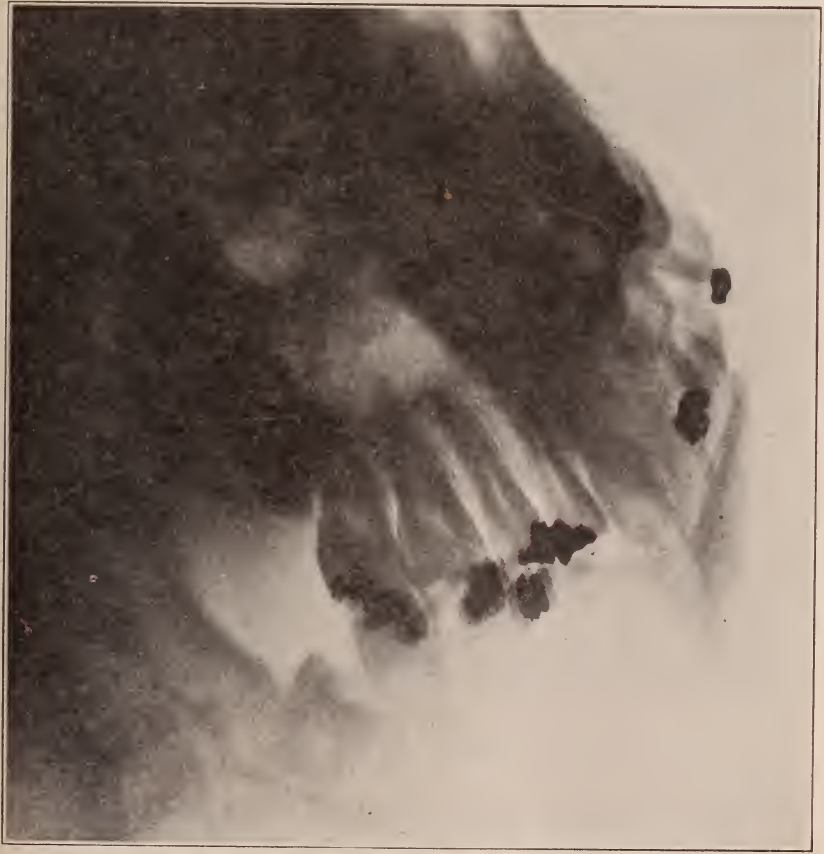

Fig. 2. Before Operation.

least resistance and produce a sinus. It may also extend into the throat and affect the tonsils producing a peritonsillar abscess; or it may burrow down underneath the bone and purulent inflammation set in, an abscess forming around the region of the unerupted tooth, developing to such an extent as to involve a large portion of the jaw and produce an osteomyelitis. Many other complications may be mentioned where impacted third molars are the etiological factors, such as necrosis, long continued antral diseases, and cystic growths.

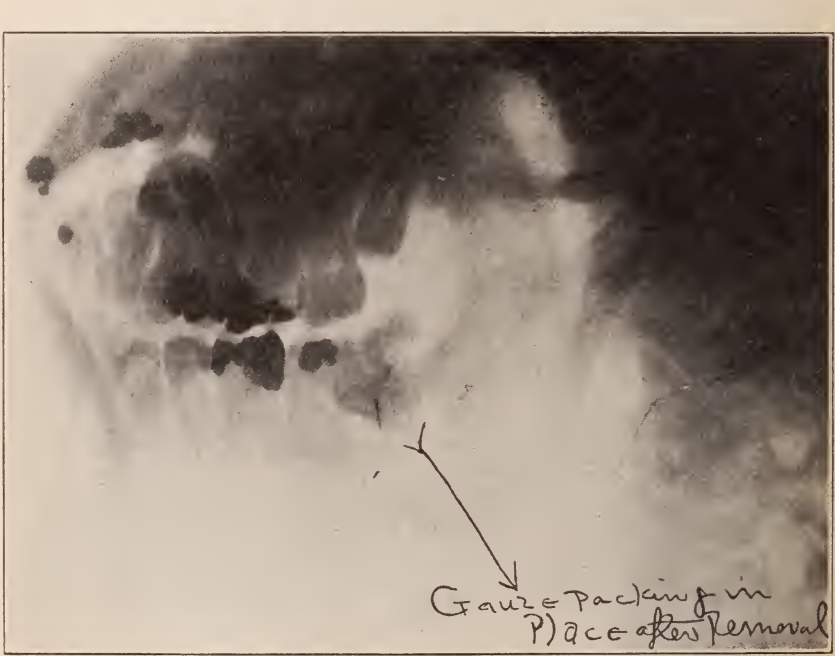

Fig. 3.

Before operating it is very essential that a careful examination be made in order to determine the cause of the impaction. Proper surgical cleanliness should be strictly carried out and every effort made to prevent infection. The teeth surrounding the field of operation should be thoroughly cleaned, and the mucous membrane covering the surfaces of the tongue, cheek and lips should be painted with iodin followed by the application of alcohol. A failure to adhere to strictly aseptic measures may cause great suffering and danger to the patient—even death.

In order to prevent the patient from swallowing a large portion of blood, it is best to have the patient lying in a prone position with shoulders slightly raised thereby throwing the head backwards.

Treatment—The treatment for the removal of impacted third molars calls for the highest degree of skill, and is surgical. Before attempting the removal and treatment, it is very necessary for the operator to have a thorough knowledge of the anatomy of the parts so as to avoid injury to the surrounding vessels and adjacent teeth. It is best to administer a general anesthetic in a hospital as the facilities are better adapted for the care and after-treatment of the patient than in the office of the operator.

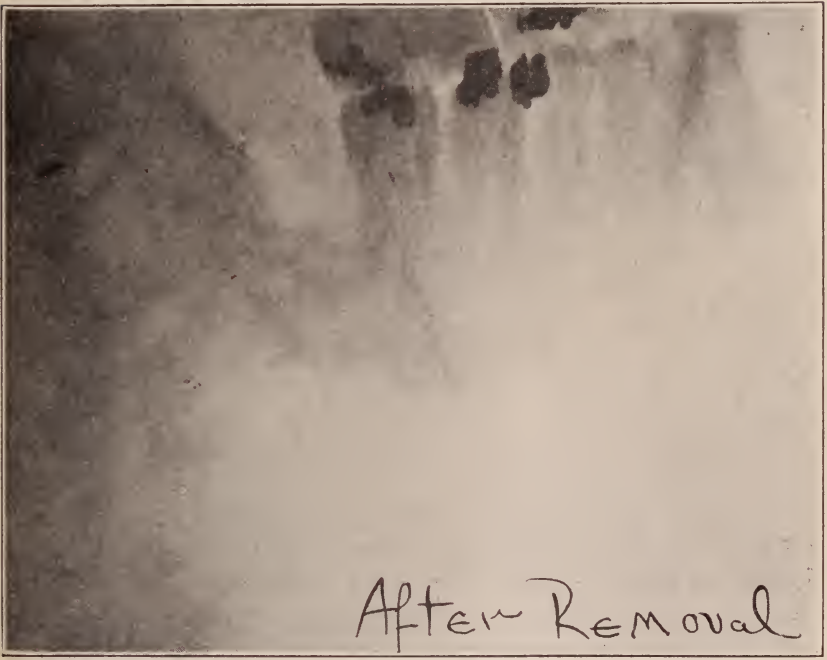

Fig. 4. After Operation.

These impacted teeth within the jaw-bone should not be subjected to forcible extraction with forceps and elevators, but should be removed along purely surgical lines. By so doing, much laceration of the surrounding tissues can be avoided. In a majority of cases, as those illustrated, the most satisfactory method of operating is the removal of the lingual plate of the jaw bone. An incision is made through the soft tissues about an inch long over the lingual side of the tooth, and then with curved scissors this incision is made right down to the impacted tooth. This tissue is elevated and a retractor placed in position to hold back the flaps of this tissue. It is very essential that the assistant keep the field of operation free from blood and mucous in order that the operator's view may not be obscured. The lingual margin of the alveolus is then cut away which may be done with large surgical burs or a chisel. Then a sufficient portion of the process is cut away to expose both roots. It is very important to remove enough of the lingual plate so as to allow the tooth to be easily removed rather than to place undue force upon the tooth with an elevator. A Lecluse elevator is applied to the buccal surface of the tooth and with slight pressure the tooth is gently loosened. The tooth then can be removed from its position with a pair of third molar forceps such as devised by Brophy. The tooth now being removed, the cavities are swabbed with iodin, then lightly packed with gauze saturated with euroform paste and changed daily. These packings may be left in for a period of from twenty-four to forty-eight hours, and sometimes even three or four days, care being exercised after their removal to keep the parts clean and see that proper healing takes place.

As soon as the patient is put back to bed, after recovering consciousness, it is very good practice to give hypodermatically a proper dose of morphine. This keeps the patient quiet until the immediate effects of the anesthetic have worn off, and prevents the restlessness so common after anesthesia. There is sometimes great swelling the day after the operation, but this can be controlled by the application of hot fomentations.

The prognosis in most cases of impacted third molars is very favorable provided proper surgical asepsis is maintained and the proper method of treatment employed.

There is a great deal more to be said about the operative and post-operative treatment of impacted third molars, but the aim here has been to touch upon some of the underlying principles with which we so frequently meet, in order that we may be able to treat our patients in a more intelligent and skilful manner.

In closing, the writer wishes to emphasize the importance of the early diagnosis of impacted third molars, as many of the severest cases of tic douloureux which baffle all efforts at relief are due to dental causes and might find relief in a manner similar to the above treatment.

Bibliography: Brophy—Oral Surgery. Winter—Exodontia.

PROCEEDINGS OF SOCIETIES.

THE ODONTOLOGICAL SOCIETY OF CHICAGO.

The regular meeting of the Odontological Society was held at the Chicago Athletic Club, Tuesday, December 5, 1916.

The meeting was called to order by the president, Dr. F. E. Roach. A paper was read by Dr. S. E. Knowles, entitled, "Thoughts on Modern Dentistry."

DISCUSSION.

Dr. C. N. Johnson:

Mr. President and Gentlemen: I want to express my appreciation to the essayist for bringing this paper before us and compliment him on the very cleancut way in which he has described these various steps in this operation.

As he said, this is one more plan in the line of preventing these infections. At the present time I do not believe that any man knows whether we get more disastrous results to the patient from the root-end infections or from the gum-margin infections. I do not believe that it has yet been definitely made out how much systemic infection we get from conditions at the ends of roots. That is something that must be worked out in greater detail than it has been up to this time, but with the present knowledge we have on this subject, it is our duty to the profession and to the public and to the patient we serve that we eliminate in every possible way the danger of infection. I am hoping for the time when we will have more definite information about this whole question and about systemic difficulties from foci of infection in the mouth. Until we can have, the best thing we can do is to eliminate the infections we find there and do the best we can to prevent those infections.

Now there is no gain-saying the fact that many banded crowns have acted as severe irritations to the surrounding tissues. There are some banded crowns, however, that have done very good service for many years without that. I believe it is always better to dispense with the banded crowns if we can, but I would hesitate very much cutting down a molar or a bicuspid that had one wall yet standing for the purpose of making a crown such as we see here. If there is enough standing for an inlay, we should use an inlay. Of course the inlay has made it possible to save many of these teeth without crowning at all where formerly we were obliged to crown them, but if I had a molar or a bicuspid, I would hesitate to cut down to the gum margin and crown in this way. Also, the preservation of that one wall either by an inlay or by a banded crown carefully fitted, it seems to me, will do just as good service as this and I believe in some cases better service. I think that should be the aim of the operator. A great many crowns have been inserted on teeth that should never have been crowned. Probably that evil is not as great now as it was a short time ago. If a tooth had a two-surface cavity, the habit was to put on a banded crown.

I do not want to add any more except to repeat what I said a moment ago that I do hope this matter of the relation of infections in the mouth to systemic disease is going to be worked out more carefully and with greater sanity than it is being worked out today by men of the profession.

Dr. J. E. Hinkins:

I cannot add very much to the paper. Neither can I add very much to the discussion, because as it appeals to me my friend Dr. Johnson has said what I could say, only better, but before I discuss the paper any further I want all of you to read the article in the *National Dental Journal* on focal infections, by Drs. Hartzell and Henrici. They show conclusively that the hemolytic and non-hemolytic infections, of which we have heard so much in the medical profession, that one is just as bad as the other. They have made hundreds of experiments. I have read it once and I think I will read it two or three times more. It is a real revelation, which shows the work they have done. It shows how little real infectious foci in the mouth come from the streptococcus. It is a marvel to us and it shows the amount of work they have done, the results they have gotten and how little infection they have gotten from the streptococcus, pyogenous and hemolytic infections of which we have heard so much in the last year.

The paper of the essayist is very good and it is timely. There is no question but there have been too many banded crowns and too many crowns poorly inserted. As Dr. Johnson said—I do not believe I could cut down a bicuspid or a molar and put on one of those crowns. I would rather take my chances of a focal infection from some of these damaging microbes, with which we have seen so many patients left, though that is a great step toward their elimination and we have got to do as much as possible to eliminate them. Another thing, I would rather take my chances of having a banded crown on a root like that than to try to drill these three holes for the posts, because I do drill a hole through a root occasionally. I would rather put on a banded crown than drill a hole through a root.

Dr. L. L. Davis:

I think the essayist has struck the right note—the key note—when he emphasized the matter of prevention. The dentistry of today and of the future must be along those lines—not so much reparative as preventive. Preventive dentistry is the future dentistry. If there is any suggestion that can be brought forward by any one in the profession that will tend to mitigate any of these things that we have seen going on for a number of years, I feel it should be done, as for instance, why we have bad results in one case and not in the other ninety-nine, or whether the matter of vital resistance has a great deal to do with the way the patient suffers as a result of imperfect adaptation or whether the patient may even die as a result. The fact that he has brought forth tonight some one method which in his mind and which in the minds of some of us will tend to help prevent the things that might happen, that to me is the essential thing in the whole paper.

We know this much, that there are a great many teeth banded —I will not say by those present—but by the average dentist in the profession—teeth banded and crowned that never should be banded or crowned, that is crowned so far below the gum margin that they have cut all connection with the tooth root and process, so that those fibers of the pericementum and periosteum have been cut and separated. Not only that, but the transceptal fibers which run from one tooth to the alveolar process of the other, are cut, so that you get a separation that nothing on God's earth can stop. That is one of the things that Dr. Knowles might add. This matter refers chiefly to those dentists who are in the habit of putting on gold crowns for which they get five dollars instead of the one dollar they would get for an amalgam filling. That is why they are put on. We know that when we take these crowns off we frequently find a good sound tooth with a cavity so small that it can be filled in fifteen or twenty minutes by any one of us. They simply have the coronal surface of this tooth cut off just enough to let the rough jacket crown slide over with a little cement to hold it.

I do not think that the essayist is trying to criticize. There have been and there are well fitting banded crowns. I have a little conceit myself, just as Dr. Hinkins and Dr. Johnson, that if anyone can fit a crown to a root I can do it. I have seen any number I put on a number of years ago and if I could do as well today, as I did then—that is what is bothering me. I know they have done service and so I am not for one minute to belittle the gold crown and if it is not proper judgment, it is not judgment in the way I have emphasized, because they are simply crowned for monetary reasons. If we can by such suggestions as these minimize the number of points from which danger may arise, then we have accomplished something.

Dr. Winthrop Girling:

Mr. President and gentlemen: It is a pleasure to be here tonight. I was thinking as I sat here listening to these gentlemen talk that there was more good to be gained out of a small society than there is in what you might call a wholesale society. I think the individual member derives more benefit from the talk you get among your colleagues and where you are really not afraid to say what you want to, because you know it is taken for just what it is said.

In regard to the essay of the evening, I must say I am very much in sympathy with a crown that is made in this way. To me the case should be mastered by the individual. Certain instruments and certain technic are more pratical in your fingers than they would be in mine. On the other hand there are certain things I can do better. Gold crowns in certain mouths I have seen last on a tooth a great many years where the band has not gone more than two-thirds the way down the tooth. A crown that is fitted under the free margin of the gum by certain individuals will be almost perfect and in certain mouths it will last indefinitely. On the other hand, a crown that is made this way has an absolutely perfect base. It must fit and there must be no lumps of cement.

As to the dowels, I do not care for a long pin. I want a pin that fits absolutely the hole I make. I am not in sympathy with the long pin, but that is neither here or there. I want my pin to fit tight and close, the same size as the drilled hole. I would rather have a dowel crown, though I would not discount a shell crown.

Dr. E. A. Royce:

Mr. President, members of the society, guests: The first thing, I think the Doctor's statement in regard to the cutting down of the tooth has been misunderstood. The first assertion he made in his paper was that any tooth that could be saved by an inlay should be inlaid, and a crown should be used only as last resort.

I have been unfortunate perhaps in the use of banded crowns. I have some beauties come back to me once in a while that seem to be doing good service, for they look well and they can grind on them, but I find on close examination of the gum in most all banded crowns, (either my insertion or put in by somebody else) an inflammation that shows that sooner or later that tooth is condemned because of the banded crown, so for a number of years I have limited the use of banded crowns as much as possible and instead have been using the porcelain jacket. That is the nearest to an ideal crown, except, I believe that with this method we can get more accurate adaptation to the root than we can with the porcelain jacket, though theoretically the porcelain jacket is supposed to fit perfectly.

Personally I want to thank the Doctor for showing his method, because it is one of the things we need in our practice. Some of those crowns can be fitted without dowels if you have a chamber that you can seat them in. Further I might say that I have placed a number of crowns where the joint did not go below the gum that have done remarkably good service and it is quite unnecessary to put the joint under the gum except for esthetic purposes. The profession at large does not appreciate the damage done by the irritation of crowns, fillings and inlays. There is much damage done by even a little natural roughness at the necks of the teeth.

The Doctor has struck, I think, the note of preservation and conservative practices in dentistry.

Dr. J. G. Reid:

As I picked up this picture, I have been reading it quite a good deal and I would be led to suppose—there are ten pictures on this plate—without any doubt in my mind, not knowing the history of the cases at all, but judging just from the pictures, that the condition of the tissues that are destroyed there was present probably before the crowns were ever put on. I would say that not advisedly, but with some degree of carefulness that where we are obliged to resort to shell crowns in the majority of the cases, they are in a destructive condition or in a tendency to destructive condition that was well established prior to the time that we started to do the fitting of the crown. When we get to the point where we see his condition that it is in now, this is the last resort to continue the usefulness of this organ. In most of the cases where that condition exists the preparation, in my opinion, if carefully done will rather lead to a regeneration, if you please, than to a continued degrading of the tissues. I wish that I had a good many crowns off that I fitted or tried to fit. I mean by that that I have fitted crowns which I wish I could have done better. But I do believe in view of the criticism that was heaped upon the profession that if we have to resort to crowns, if the adaptation is properly prepared, that it is possible to accurately fit a band to that tooth that will not be a menace. The condition of destruction, such as is presented here in these pictures, is the result of the mechanical irritation of picking the teeth, jamming the wooden toothpick under the gums and pushing the food out. Now, of course, if the band is not properly fitted, the food will become packed under it and probably that leads to the habit of pushing the food and stuff through with a wooden toothpick, but the majority of cases where the tissues have been destroyed to a great extent are not the result of bands—they are the result of the toothpick habit. I can see greater destructive results from that source than I can ordinarily from other sources.

Now the thing I liked about this paper was this. For one thing it was short and sweet. You saw exactly what you wanted to see, the way to do it, the technic has been described to you in such a way that it becomes useful to anyone around this table if he desires to utilize it. The technic here is a little bit different from the majority that I have had the pleasure of seeing. I have not seen everything, of course, neither have all of use seen everything, but there was another point about this dowel on a molar tooth. I do not believe as a rule that it is good practice to weaken the walls of a molar tooth by boring out canals in order to get a pin in there that would be strong enough for the crown. There is great danger of fracturing, and I certainly feel very much like cautioning against this wholesale practice of reaming out the roots of teeth. I believe it is dangerous even in careful hands. As a rule, unless you have something in the shape of a picture to show you what you are doing and what you intend to do, boring into a root to my mind is not generally good practice. I would rather take my chances with the banded crown than with the dowel.

DR. ROYCE:

Mr. President, may I say a word? Recently it has been my good fortune or bad fortune to take off a number of banded crowns that have been put on by operators I think a great deal of, and to replace them with jacket crowns. With very slight attention to the surface of the roots and a perfect joint between the porcelain and the root, I have found invariably a great improvement in the gums around those teeth, so much so that I have felt absolutely repaid and the patient has felt repaid in the effort that has been made.

DR. HINKINS:

If he had replaced the shell or banded crown on that tooth and had taken the pains to have a proper feathering of the edge of the crown, in all probability the result would be just the same as with the jacket crown.

DR. ROYCE:

The difficulty of making an absolutely smooth feather-edge joint between a gold crown band and a root is so great that the ordinary dentist cannot do it, and you will find an irritation there that is similar to the irritation you find from calculi.

DR. F. E. ROACH:

This is a subject that is right close to my heart and there is not a man here who has said a word on the subject, if I understand what Dr. Knowles has said in his paper. I do not believe there is a man here who has understood Dr. Knowles' paper at all.

Dr. Knowles said plainly just where he employs it and he showed nothing but molar teeth. He said nothing about anterior teeth. He said that it was adapted best to molar teeth, as I understand it. I do not remember whether he specified molar and bicuspids. I inferred that he meant if the molar and bicuspids could be restored to normal condition by means of an inlay, that it should be done in that way. He takes this as a last resort in the restora- of these teeth. He is producing a crown for teeth that are beyond inlays. Now those of us who understand the possibilities of the inlay of today are making use of the inlay on teeth that are almost gone. The grinding portion of those teeth are almost gone. I know you have all made inlays for teeth that have been very extensively decayed and restored the teeth better than by any form of crown possible. I think that is the position that Dr. Knowles takes and then he presented this method for the restoration of molar teeth. It is absolutely beyond criticism in my judgment for the reason that the technic is definite and the principle is right. I do not believe there is any one who can criticise any part of the technic. The question of putting those posts in the canal—they are small and they are parallel one with the other so that they can be put into place. As to the posts weakening the roots and producing the likelihood of fracture, I think it is just to the contrary. It strengthens and lessens the likelihood of fracture. Your fracture of a molar is going to be at the bifurcation and not at the canal and so the posts strengthen. The joining together of these roots with these copes and this dowel is an element of strength.

The success of this crown, as Dr. Knowles makes it, is dependent upon two or three things. First, the accuracy with which he makes his fitting and the definiteness with which he takes these steps in securing this fitting of the crown. Then he uses platinum in place of gold. In doing so he not only has a great mechanical advantage, but is using a material that has a great compatability with the tissues. That does away with the intolerability of material as well as the ill-fitting of the crown.

Q. What do you mean by the intolerability of material?

Any alloy of gold in the mouth will be a source of irritation to the tissues, even though it be a perfect fit, as perfect as human hands can fit it, while platinum or porcelain will not cause an irritation. You have seen lots of times porcelain crowns—the so-called "hand me down" crowns—fitted very poorly to roots and still you will see those gums look fairly healthy, simply because it is porcelain and not metal. I think that is one of the main reasons why Dr. Royce's porcelain jacket crown is tolerated so much better than is a metal crown. Then I do not believe—and I think I am pretty careful with my fingers—if I do say it, I believe I can fit a jacket crown as well as the average, if not a little better—it is possible to make a jacket crown, fitting a joint of a jacket crown, I do not believe it is possible to make it so that it is so free from mechanical irritation as is this crown that Dr. Knowles has shown us tonight. I believe it is possible to make a more smooth peripheral continuity of the crown root than with a jacket crown. After you have your platinum accurately fitted, you have less irritation and have restored a molar tooth that was beyond restoration with an inlay. I think the technic is absolutely perfect.

Dr. Hinkins:

You have not yet explained the intolerability of gold crowns.

Dr. Roach:

I have no more to say than just the every-day observation of the debris and food products around the gums on crowns. Just as Dr. Royce says, these teeth that are not highly polished are sources of greater irritation than the porcelain crowns. I believe there is soemthing inhibitory to bacterial growth in this locality.

I disagree with the statement that it is possible to get a better continuity with a butt joint than a lap joint, that is, a continuity that will be tolerated by the tissues. You know how hard it is with an inlay with all the margins above the gum and how hard it is to get a butt joint in casting or in burnishing that is a perfect one. You know it is a great deal easier and if you do not know it you have only to make a very few practical experiments to find out that it is easier with a lap joint. It is not easier for the reason that it is hard to get a smooth periphery with a jacket crown or even this crown than it is where you have a slight bevel and where you can press the platinum to a very thin feather-edge against the bevel of your tooth and you will find that you have a surface that will be perfectly free from irritation to the tissues.

I have come to the point in my life where I am not afraid to stand up and tell even the biggest crowd of dentists in the world that I am done putting on banded crowns in the anterior part of the mouth, unless it is absolutely necessary for the strength of the tooth. I will further state that in all teeth where the roots are of such continuous surface where I can make a fitting of that root and make a crown that I buy from the store, I am using that crown almost entirely for individual anterior crowns with most beautiful results. If those crowns were fitted as they should be and as it is possible to make them, you can absolutely preserve the continuity and make an absolutely good butt joint between the porcelain and root, in fact the gum tissues will take better to it than they will around ninety-nine per cent of the natural teeth. I am stating that plainly and I am positive I am right. I have held it under cover and I have been rather afraid to say it out loud, but I am saying it now with emphasis. I hope to see the day when dentists will stop putting on Richmond crowns, gold bands—the so-called Richmond crowns. I think they are the greatest abomination that ever went into a human being's mouth. That is speaking pretty frankly, but I am honest and I believe better results could be obtained with the ordinary porcelain crown.

It takes time to make a good crown that is as nearly free from irritation as it is possible to make it and I know it. I have made a good many jacket crowns and I have made a good many crowns of all kinds, both swaged and burnished and I have followed almost all technic and I have failed to find a crown that is as satisfactory as the ordinary porcelain crown that you buy in the store. I have spent more time fitting these crowns than would be required to fit a Richmond crown, but I have got something for my trouble when I am through.

There is another serious objection that I have to Dr. Knowles' crown. It is a difficult crown to make. The technic is complicated. It requires a high degree of skill in the first place to make a fitting as Dr. Knowles has outlined it. Then to build it up and restore it and get the proper conclusion requires a high degree of technical skill. After it is all done, it is a beautiful thing. It is a work of art and it meets all the requirements of the ideal of most of us when you have it made, but if anything goes wrong with the crown there is trouble. Dr. Knowles knows that the technic there is very similar to a technic I followed many years ago.

I would like to show Dr. Johnson the little patient I took up to his office, in whom I restored a whole crown with moldable porcelain. I have dozens of those crowns standing today and the conditions are almost ideal. If that material could be taken up and produced by some one who could make it correctly it would be ideal. With this crown of Dr. Knowles' it would practically be destruction to the tooth if anything goes wrong. If the crown itself breaks, it is quite a chore to repair. Those are the only criticisms in a serious way. In other ways it is nearly ideal.

Dr. Girling made one remark which I did not quite agree with. It is quite true that we will follow a plan that we feel most competent to do, but I do not think that that should govern our procedures to the extent that Dr. Girling seems to indicate. I think if we see another way that is right, it is our duty to master that technic, if it is going to be for the betterment of our work. I am not in a disposition to agree with the opinion that we all have certain dispositions for certain things. I think that if we knuckle down we can do all things that the other fellow does. I do not think we should condemn a certain line of technic in crowns because we feel that we are not capable of doing it.

Dr. Knowles (closing the discussion):

No doubt there are men here who attended the meeting at which Dr. Edmund Kells of New Orleans read a paper before the Chicago Dental Society that opened my eyes. I have had occasion to read a few papers and my experience in the past has been that I read the paper, inserted all the points I knew, and at the end left nothing for the other fellow to say. I knew that tonight I was coming to be with friends and frank criticism was what I wanted. Now I have been complimented by one man and jostled by another and so on. I am not going to talk long. I am going to try and say what I have to say in just as few words as possible.

Dr. Roach made a good point when he said we want ordinary things, the ones we see everyday use for, but, gentlemen, we want both. We have had in the last two years a great many new things and every man here has gone to meetings to hear them. I noted the stress Dr. Hinkins placed upon Dr. Hartzell's article. I presented this paper to get something out of it and I have got something. Still I tried to introduce this point. This is simply one of a great many different convictions we are reaching today. Gentlemen, I could not conscientiously come before you and have the courage to say that certain crowns have no place in modern dentistry. I simply said this that in molar teeth that were so badly broken down that there was nothing above the surface, above the gum-line, this crown was the best. It would surprise you to see the cases in which I insert post-inlays. But for instance I recall the case of a woman who did not want this sort of a fire-engine in her mouth. This is one of the cases which justified me in removing a larger piece of the tooth. Where I can, I simply make an inlay with posts. Where I cannot, I believe this is a better technic. I believe it is an improvement over the shell crown. Practice teaches us many things. I may have carried this to the extreme no doubt, but I simply tried to show a number of models. I have not tried to show the practical application. I will agree with you it is a difficult problem. There is not a thing we do that is not a difficult problem. It is possible for you to fit the posts and the coping. It is a physical impossibility for you to fit that in the mouth as well as in the model. I have attached a second piece to the first and then a third piece that does not fit perfectly, but the solder fits in between and I have made a satisfactory coping.

Another point that was not brought out would be a point on the irregular outline. If a man can make a better shell crown, I would say make it. We must consider further that gold no matter how well polished, does not fit as well as porcelain. Another fact is when possible to leave the enamel line of the natural portion of the root, which in banded crowns is trimmed off.

The toothpick question was referred to. Why do people use toothpicks? There is no better service we can do than to do away with the toothpick.

Another point brought up was about the bifurcation. I have had no trouble with the bifurcation, but I will say this, if it is interesting to hear it that in the technic of opening these canals that the finest spiral reamer works the best. If the canal is first opened sufficiently to admit this, then you will not have much trouble. It is when you take a large reamer that you have trouble.

Dr. Davis touched on a point that I tried to make clear. I have not said in a positive way that the foci of infection in the mouth were the cause of a secondary infection. I talked to a man last night who told me his reason for believing in foci of infection. He said that he found cases that were suffering from secondary troubles which had improved after the elimination of the trouble in the mouth. If there is a lodging place for these micro-organisms, they are going to stay there and when there are more micro-organisms present than should be, then there is a congestion produced. I believe the mechanical irritation is of no great consequence. What I have tried to do is to show one means of eliminating the bacteria. We have dozens of others.

I will not say any more except to say that I have been delighted to bring out the discussion tonight and I have learned a good many things myself.

NORTHERN ILLINOIS DENTAL SOCIETY, TWENTY-NINTH ANNUAL MEETING, HELD AT AURORA, OCTOBER 18, 19, 1916.

DISCUSSION OF THE PAPER BY DR. FLOYD D. LEACH ON "DENTAL RADIOGRAPHY AS APPLIED TO MODERN DENTISTRY."

DR. M. D. K. BREMNER:

Mr. President and Members of the Northern Illinois Dental Society:

Sometimes a good paper is spoiled by being too long. Again, occasionally a mediocre paper redeems itself by the very fact of being short. Dr. Leach has done both. He has given us a good paper and made it still better by being brief.

Without the waste of a word or syllable he has given us a complete résumé of Radiography as applied to dentistry. He did not tire our attention, and yet I am sure we all know more now about X-ray than we did before we listened to that excellent paper.

The title he has selected is "Radiography as Applied to Modern Dentistry." I think that is a lucky phrase. I like that word "modern" dentistry for if there is anything which tends to make dentistry modern it is certainly the application of the X-ray. For after all, what is the difference between the ancient and the modern; between the past and the present, if not just that.

In the past, man believed and speculated. At present we observe and deduct, and so in dentistry we used to believe that we filled the roots to the apices and speculated on the results, but now we take an X-ray picture and we know, and when we see some of these blind abscesses around those roots we deduct the dire results that may happen to the owner of those roots.

I quite agree wtih Dr. Leach that an X-ray in the average dental office is perhaps not indicated. For after all radiography is a form of photography and photography is an art and no art can be studied out of a book. You have to work and devote a great deal of time and diligent application before you can master it and the average dentist hardly has time for that. Furthermore, the reading of a picture requires a great deal of experience and knowledge and, therefore, I think the results would be a great deal better if we sent the work out to a man who makes a specialty of it, and I agree with the essayist that some one man in a town should devote himself to it and the others send their work to him. It means more co-operation among the dentists and I am sure it will do us no harm.

There is still another phase of this subject that I would like to bring up; a phase that is seldom heard at our meetings, and I refer to the economic side of good dentistry. I am somewhat of a crank on this question of economics and the reason for it is that I believe in economic determinism. You know perhaps that Buckle was the first man to call our attention to the fact that the methods which any aggregation of men pursue in the making of a living determines their religion, ethics, morality and so on. Now this is true of dentists as well.

The economic status of the dentists will be the main factor of determining the quality of the dentistry and until this is fixed, no matter how much we talk about the necessity for improving our work, very little improvement will take place. I am going to make a statement and if anyone here wishes to throw a few bricks at me he is at liberty to do so—I know I am speaking the truth.

Three years ago or more Dr. Mayo threw the gauntlet to us by saying that the next step of preventive medicine lies in our hands. Since that time every meeting and every gathering has been full of the subject of focal infections and the dire results which they bring on. Nevertheless, I am willing to wager that the average number of X-ray pictures taken of roots by all the men assembled here this evening will not be in the ratio of one per day per man, and yet the number of teeth treated by each one is several times that. Now why? Well, the answer is just this: You can't afford it. It is a case of deciding between the health of your patient and the welfare of your family. Of course you decide in favor of your family and I don't believe anybody can blame you.

Now the question is: What are you going to do about it? You will have to answer it some way.

After all, good dentistry, in my opinion, is largely a matter of fees because it takes time to do good and thorough work and we cannot devote the necessary time unless we are paid for it and with the present state of the public mind on this subject it is next to impossible for ninety per cent of us at least to collect the required fee.

A large body of the public still think that the best test of good dentistry is that the fillings should stay in, or the crown should not come off, and unless we can educate them to the importance of these things which we have treated here at this meeting the whole day, namely, root canal work, and X-ray, making them realize the terrible results that follow from imperfect work, then and then only will it be possible for us to get the remuneration which will enable us to do dentistry as it ought to be done.

To bring this about we must disseminate this knowledge of the new or modern dentistry among the people of this country. It's a big job—it will take a lot of effort, but if we co-operate and work honestly and sincerely it will be accomplished.

I thank you.

Dr. G. E. Cleophas:

Mr. President and Members of the Northern Illinois Dental Society:

I can assure you it is a pleasure to me to meet with you here and listen to these splendid papers and discussions.

Radiography as applied to modern dentistry is, in my estimation, one of the most, if not *the* most, important innovation that has ever been applied to dentistry. The public is benefited not only as regards masticating efficiency, but much more as regards the general health. And the dentist is benefited by being raised farther above the mechanical, to a point where services are vital to the public welfare.

And if dentistry is a science, we must deal with everything in a scientific way. If an X-Ray shows us something, what is it and why is it there? What can we do and what are we not able to do?

Regarding tooth conservation, our better diagnostic ability with the aid of radiography, has placed dentistry in the third of a series of three eras.

The first period through which dentistry passed was the ruthless removal of almost every decayed and offending tooth.

The second was the saving of everything having the semblance of a tooth that could be retained in the dental arch.

We are now in the third era, which I have mentioned before, where, with radiographic aid, we are now able to diagnose pathological conditions so accurately that we must put our patient's general health on the balance against masticating efficiency.

It has placed dentistry on a higher plane in its relation to general medicine and surgery. As another important factor, metastasis, which we have not considered before, comes in, having a very important bearing on our patient's general health.

It should no longer be a disputed point that a tooth in which the pulp has died or in which it has been removed, is a possible menace to the owner's health, unless the root-filling has been done with the greatest care and intelligence.

The writings and research work of Billings, Rosenow and others of unquestioned ability and unequaled clinical facilities, should be accepted until proven wrong. Rosenow has so well illustrated the selective action of certain organisms found in the mouth, for example the streptococcus viridans in joint infections.

How can we determine in a great many cases if our patients are carrying possible foci of infection about the apices of pulpless teeth except by radiodontia?

And here I want to lay particular stress on the fact that we must not only hunt for the large, dark spots in our radiographs, which may mean a large area of bone destruction at the apical ends of the teeth, but if we see a root that is only partly filled, with an open canal that can be seen in the picture, we have at that point not only an area of lowered resistance, but from my own research in the bacteriology of these cases, I am satisfied that in the majority of them, these canals are infested with a virulent and dangerous organism.

And another thing which cannot be determined by the radiograph, is that if the root-filling is not packed in tight, thus sealing the end of the root, it is just as liable to infection.

I fear I am going into the bacteriology of these X-Ray findings almost to the point of getting away from the subject, because I want to impress upon you that we must have a good understanding of what every rarified area, open canal, etc., means in order to diagnose and determine the pathogenicity of all abnormal findings.

How can we tell how far an infective pericementitis has destroyed the supporting alveolus, and how much of that which is left is of a necrotic nature, except by the aid of the X-Ray?

From 32 cultures I have taken and received bacteriological laboratory reports, within the last few months, from apical ends, areas and pyorrhetic conditions, about 75% show a streptococcus, mostly of the viridans variety and some of the hemolytic type, and several of these have been found in the pure culture. In every case but one, where the pure culture was found, the lesion was small. The largest apical area destruction I have found in any case, except from cysts or maxillary sinus involvements, was infected with a streptothrix. I have found rarified areas at the ends of roots, caused by over-medication with too strong a drug, for example, a medicated cotton root-filling which had been in for nine months showed a negative bacteriological report.

The essayist has well enumerated the various uses to which we can apply radiography and I want to add that we as dentists have to deal mostly with bony or hard structures of the body, so it is of special value to us.

I do not exactly agree with the essayist that there should be one machine in each community to do the X-Ray work for that community. I have come to consider my X-Ray machine as some of my most important office equipment. In root canal work, resections and numerous other operations, it is often a wonderful help to both patient and dentist so that a roentgenogram of the case can at once be consulted within ten or fifteen minutes.

Some of you may feel like asking, how does it work out in the smaller cities to have a machine in the office for your own private use. I have carefully gone over my records since I have had my own machine, and find that I have averaged about three pictures a day in my own private practice. You cannot do intelligent dentistry today without at least having access to one. As the essayist has said, the public are demanding its use and a moderate priced outfit, that will do good work, is a paying investment in dollars and efficiency.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

A CONFIDENTIAL WORD TO THE CONSCIENTIOUS X-RAY MAN.

We need you in our work, and we are very grateful for your services. You have done much good, and are capable of doing much more good. You have also done great harm, and are capable of doing still greater harm. Let us get together and study how this harm may be avoided. In the first place you are assuming altogether too much, and are making many unwarranted statements. The simple fact is that you do not know many of the things you claim to know. You glibly write "pus-pockets," "abscess," "infection," "gross infection," opposite certain teeth when there is positively nothing of the kind associated with those teeth, and what is worse you hand this false information to the patient thus frightening him into the removal of useful teeth which can never be successfully replaced. You are too often men with a single purpose—the purpose of finding something. Sometimes you are a dentist earnestly seeking for the truth. Sometimes you are a dentist who has studied dental histology and dental pathology; and who is alert to the problems presented in maintaining the mouth and teeth in a condition of health and usefulness. Sometimes you are a physician who has been well trained in general medicine and in diagnosis but who knows almost nothing about dental histology or pathology, and has not the slightest conception of the significance of saving or losing a tooth. Sometimes you are neither a dentist nor physician and are utterly devoid of knowledge regarding pathological processes. You could not diagnose a mountain torrent from a cataract of the eye, and yet you sagely make a diagnosis of mouth conditions and write it down for the patient to read. In this you may be doing the dental practitioner a grievous wrong—in fact you have done it in many instances. What is infinitely worse you may be doing the patient irreparable injury—you have done it. You have needlessly frightened many a patient into the extraction of teeth that should never have been removed—leaving the patient in a worse condition than before.

Let us reason together and see if we cannot be mutually helpful one to the other, and serve the people better than we are doing. We—the men who do not make X-ray pictures—need your aid in many ways, and we cheerfully accord to you the ability to produce a better picture than we could possibly do. But we want you to remember this one thing and abide by it;—you have absolutely no right to diagnose any case and pass your opinion upon it without consultation with the dentist who has had the case in charge. No X-ray evidence should ever be taken except in conjunction with the clinical history of the case. Not that we ask you to merely take a picture and remain passive in the matter. We welcome your opinion stated to us frankly, whether that opinion is right or wrong. You may be able to detect evidence in a picture that we would overlook, and we thank you for calling our attention to it. But we ask you to cease from this time making a diagnosis to the patient, and writing those mystic and formidable legends on X-ray pictures "pus-pockets," "infection," etc., etc., and handing it to the patient. Why? Not because we want to have the truth hidden, but because we do not want people misled. And in the past people have been woefully misled. You have written "abscess" when there was no abscess. You have diagnosed "pus-pocket" over the apical end of a root which on investigation contained a perfectly healthy living pulp, and you have condemned teeth on X-ray evidence which were entirely harmless and altogether useful. The simple fact is that you cannot tell what is meant by a shadow around the root of a tooth in an X-ray picture, and until you know more about this you have no right to condemn a patient to the agony of apprehension and the terror of uncertainty produced by reading such highly-colored terms.

If you will co-operate with us conscientiously and conservatively in clearing up the many problems which confront us in our work, and in which you can be of such splendid service, we shall take the greatest pleasure in working with you and supporting your efforts; but if you continue in the way some of you are traveling it will not be long before not only the profession but the public will be heaping on your head a righteous malediction and crying in your ears the unhappy word "Anathema."

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO II.

My Dear Boy:

That first patient is very important. Not because first patients are necessarily people of great distinction—usually they are not; but somehow the significance of that first patient impresses me as I think back over the careers of many of our great men. I have in my possession now a strip of gold rolled from the first filling inserted by the late Dr. W. W. Allport when he began practice in Chicago in 1854. Thirty-five years later the tooth became loose from pyorrhea, and was extracted by Dr. F. H. Gardiner and given to Dr. Allport, who had the filling removed and rolled out into a strip. The placing of that first patient in his chair was a very significant procedure to Dr. Allport. His equipment consisted of an ordinary rocking chair tilted back to answer his purpose, a plain table with a newspaper for a cover as his operating case. From this small beginning he built up one of the best practices in Chicago. Contrast this with the equipment that most young men have today when they begin. The world is moving, and fortunately it is no longer necessary for the young practitioner to handicap himself with so meagre an outfit.

The importance attached to the first patient in your case relates to the kind of impression you make on the patient, because remember this that your future success or failure depends after all on the impression you make on patients as they come to you day by day. No matter how brilliant you may be in the profession, unless you can impress your patients with the fact that you are capable and conscientious, you cannot build up a successful practice. It is the point of view of the patient that counts, and it is the influence you exert that creates the point of view. The recommendation of one patient to another, and this radiating out in an ever-widening circle, is the basis upon which every successful practice is built. Be very careful of the kind of impression you make upon your patients.

No cut-and-dried rule can be made for the management of patients; no sovereign remedy for their control. They are as varied in temperament and mood as are the stars of heaven in brilliancy. But there is one fundamental requisite that stands out with supreme importance if you are to win and hold a practice. Everything else is subsidiary to this—everything else incidental. Unless you are prepared to practice basic honesty with your patients you need never expect to be permanently successful with them. This is as irrevocable as the movement of the spheres, as fundamental as the universe itself.

I fear you do not accept this in its full significance—few young men do. And I am perfectly willing to acknowledge that at times appearances are against it. You have seen, or you will see, men in professional practice skating around the thin edges of probity and horror instead of remaining out on the solid ice; and you will see them apparently succeed and carry off the laurels of patronage and gain. But just so surely as the sun shines the ice will eventually break and they will drop into the pool of disaster and defeat. I have never known it to fail, and I have watched the career of men most carefully. I wish you could know how very true this is, because unless I can get you to start out with this as your chief article of faith I have little hope of your ultimate success.

As a professional man the world expects more of you in the way of high ethical conduct than it does of the merchant or tradesman, and justly so. As I have already intimated your obligation to society is more sacred and subtle than theirs, and when I speak of honesty on the part of a dentist I mean something finer than merely giving a dollar's worth of service for a dollar; or paying bills when they fall due. I mean the following of a line of conduct which shall take into account the welfare of the patient in all those matters in which the patient cannot be supposed to judge. I mean studying the patient's interest and conserving it in exactly the same manner that you would wish yours to be conserved if the conditions were reversed and you were the patient. And you have no idea how very hard this is to do till you have tried it. Human nature is so selfish in its tendencies that most of us have to make ourselves over in order to always do the really ethical thing. You will often see it stated that the observance of the golden rule is the true standard of professional conduct, as in fact it should be the standard for all conduct. This is correct. "To do unto others as you would have others do unto you," is a sublime truth of faith, and yet I have often felt that it did not go quite far enough —that as applied to professional life it needed elaboration and refinement. If our judgment were infallible it might do, but as a matter of fact the things we would have done unto us are not always the best things for us. In the sense that we should employ our superior knowledge to direct the patient to do the thing which we know is best the golden rule in its essence is all-sufficient, but many of us are inclined to take a superficial view and shirk the real issue. We cannot successfully apply the golden rule till we have so grounded ourselves in the fundamentals of correct conduct that we are able unerringly to distinguish right from wrong, and this is a more difficult matter than most of us suppose. To know the right thing always is very near to omniscience. In fact it is often easier to do the right thing than it is to know what is the right thing to do.

I hear you say: "What has this to do with the practical affairs of life?" Ah, my boy, this is the most practical thing in life. I will try to be more specific in my next letter.

Sincerely your friend,

C. N. J.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

Sterilizing Canal Points:—Fine canal points placed on a cement slab and sprayed with sulphuric ether with an ordinary atomizer will be sterilized and stiffened.—*F. A. W.*

To Prevent Pain and Bleeding After Extraction:—Press a piece of cotton into the socket saturated with equal parts of tincture of iodin and chloroform and leave it for five minutes.—*A. Berthold, Chicago.*

To Prevent 95% of Phenol From Crystalizing:—Instead of warming the phenol add a few drops of denatured alcohol and you will find that it will remain solvent no matter what the temperature of the room may register.—*William V. Sher, Chicago.*

To Apply Iodin:—Iodin will penetrate the deepest pocket or crevice if the tissue is thoroughly dried. Napkin the mouth, evaporate the moisture by use of warm air, chip blower or compressed, and apply tincture of iodin. Wait thirty seconds before removing the napkins, which should be moistened first. Treat in like manner every other day and in a few weeks you may decide that pyorrheatic conditions may be bettered.—*Homer Almon.*

To Cool Casting Flask—After burning out wax model and removing from over the flame invert flask and place on soldering or asbestos block which is so placed under a soft brush wheel on the lathe that the brush wheel will, when lathe is turned on, cause enough air current to materially shorten time necessary to cool flask to room temperature when the casting truest to requirements may be made.—*J. F. F. Waltz, Decatur, Ill.*

Sharpening Hypodermic Needles:—A dull or rusty needle is a prolific cause of abscesses. Wipe the needle from time to time with crocus cloth procurable at hardware or cutlery establishments. Have a good hone, such as the Washita razor hone. Thrust the needle with the wire in through a bit of soft cork long enough to come within one-quarter inch of the beginning of the bevel of the needle. The cork serves as a handle, also holds the needle stiff. A few light rubs upon the hone puts a keen point on dullest needle.—*J. M. H.*

A Good Sprue For Thin Wax Models:—A double sprue can be made from the simple cross clip used for holding papers together. Bend the cross pieces apart to make a staple to meet the size of the wax model. Heat the points and insert in the wax while still in the cavity. Remove and invest by dipping the model into the investment and carrying deep enough to just cover the cross-piece. When the investment is hard this cross-piece can be cut with a knife-edged wheel and the mould trimmed to receive the metal. Each end of the staple is then a separate sprue and can be easily removed. This sprue is of course especially useful in mesio-occluso-distal cavities or wherever the wax would be liable to break in the center on account of thinness.—*Frederick W. Stephan, Chicago, Ill.*

A Cast Cope Crown:—In making a cast cope crown with either a porcelain crown or facing the best results are obtained if the post is "cast integral" (as the auto salesmen talk it) with the cope itself. Make the orifice inside the root a trifle larger than usual, slightly grease the inside with white vaseline, form the casting wax to a small pointed post shape in the fingers, insert in the enlarged and lubricated canal, press firmly to position in the canal and over the end of the root; quickly press the previously carefully ground crown or facing to position and you have an adaptation that will require the very minimum of manipulation and correcting in order to become perfect. Before investing scrape a *very* thin shaving from entirely around the post in order to allow the cement to have sufficient room to escape when the finished crown is set.—*Arthur G. Smith, Peoria, Ill.*

Matrix for Gingival or Cervical Silicate Cement Filling of Ten Anterior Teeth:—After the rubber dam and Hatch cervical clamp are in place with the bows of clamp well up to clear the gingival wall of the cavity warm a piece of modeling compound and take an impression of labial or buccal surface of the tooth, allowing the impression material to extend well up gingivally to rest against the bows of clamp—that is secure a definite impression of the bows. It is well to moisten the surface of the area of which the impression is to be taken before placing the impression material to prevent adhering of the material to the parts. When the modeling compound has cooled sufficiently, remove and with a spoon excavator carve away any of the impression representing cavity or lost portion which will give a modified impression representing the perfectly restored tooth. At this time one should be careful to so carve away the modeling compound where it has flowed around the bows of the clamp that it will seat easily and perfectly when replaced in position at trial before using it to mold the filling. It is now lubricated with a film of cocoa butter and laid aside, cavity prepared for filling, the mix of filling material made and inserted, then the prepared matrix is quickly but accurately seated in position and at expiration of setting time one will have a perfectly molded filling with only slight excess of material over any of the margins.—*Eugene Maginnis, Chicago.*

Silicious Cement Fillings Without the Rubber Dam; Method of Coloring in Order to Get the Shade:—In those cavities near the gingival margin, especially in the anterior upper or lower teeth, where it is torture to apply the rubber dam, this method is practical. The cavities are prepared in the usual way with sharp burs almost the same as for a gold inlay, but a slight undercut is used. If the gums weep or bleed, touch with trichloracetic acid. Use cotton rolls between the tongue, teeth and lips, with the saliva ejector in place. While the assistant dries the cavity with small pieces of spunk, mix the cement on the flat side of a bottle, filled with water at the temperature of 65° F. The particular color desired is obtained by using pigments. Yellow, gray, brown and blue, are all the colors desired. Start with light or dark yellow and add the white powder, then gray-blue, or brown pigments. A very tiny bit of these pigments is sufficient to make any shade of coloring to match any natural tooth. Agate instruments are used in mixing and placing the cement in position, and two right angle steel trimming knives used to trim the surplus after the filling has set. These knives pull towards you instead of pushing away. As soon as the fillings are set, which takes about five minutes, they are covered with film of melted paraffin, and the patient dismissed. The fillings are to be polished at a future sitting. By this method such fillings are inserted much more satisfactorily without the rubber dam, and the exact shade of coloring is insured with the use of pigments, especially that particular shade of cream-gray so much desired.—*George D. Sitherwood, Bloomington, Illinois.*

The Use of An Isotonic Solution for Pressure Anesthesia:—To anesthetize the dental pulp by pressure anesthesia we must first get our solution into the pulp, and then through the semipermeable membrane of the nerve cell. This can be done in two ways. One is to drive an indifferently mixed solution, causing considerable pain because of the slow absorption, or to use a carefully mixed solution that is absorbed readily with no pain. To accomplish this we must recognize certain physiologic factors; that is, the laws governing the absorption of solutions or the passage of fluids through a membrane to become diffused with the plasmic fluids on the other side, namely osmotic pressure, so it will be necessary to have our solution equal in tone with that of the cell, or isotonic. Hence the use of an isotonic solution is the all important factor and especially so when the pulp is inflamed. We know that in inflammation we have certain circulatory tissue changes. The arteries become engorged, and white cells and serum escape through the walls of the capillaries into the surrounding tissue, causing an over saturation of the same. As water passes through a capillary wall more readily than salt it is fair to presume that these saturated tissues are hypotonic or deficient in salt. Consequently if our solution be isotonic it will be instantly absorbed.

I prefer the Ringer solution to normal salt as a vehicle for making these solutions because the addition of calcium chlorid increases the osmotic pressure; that is it stimulates leukocytes and increases the absorption of the anesthetic.

I like novocain and find a 2% solution of novocain and superanin to be sufficient; however cocain will do as well if the solutions are carefully prepared. Great care should be used in preparing solutions. A fresh one should be used each case. Solutions must always be boiled to be assured that they are sterile.

The technique of pressure anesthesia is as follows:

The field must first be isolated. If the tooth is broken down so that a rubber dam cannot be placed on it a copper band should be cemented to place. This will also facilitate in keeping the solution from leaking under the pressure. After cleaning and sterilizing the cavity, place a pellet of cotton saturated with the solution in the cavity. Then form a plug of base plate gutta percha the approximate form of the cavity and stick it to a large sized amalgam plugger. Then moisten the end of the gutta percha with the oil of cajuput and warm the end, but not the whole form. This softens the end of the gutta percha so that it seals the periphery of the cavity and the solution will not leak. A slow steady pressure held for about a minute will insure results. Of course if there is no exposure it may take a second application after exposing the pulp.

The indications for the use of pressure anesthesia are all cases where extirpation is necessary and there is no infection. If infection is present conductive anesthesia must be used.

I do not believe in the use of arsenic as that drug is not self limiting and I believe that in many cases its action extends beyond the apex of the tooth causing destruction of the surrounding tissues.—*Lester F. Bryant, Chicago, Ill.*

MEMORANDA.

DR. W. A. DARTT.

Dr. W. A. Dart, of Peoria, Ill., author of a dental ledger and appointment book is dead, aged 65. He formerly practiced in Milwaukee and Chicago.

ALUMNI MEETING.

The Clinic of the College of Dentistry, State University of Iowa and Meeting of the Alumni Association will be held at Iowa City, Iowa, March 7th and 8th, 1917.—F. B. Whinery, Secretary of the Alumni Association.

KENTUCKY STATE DENTAL ASSOCIATION, FORTY-EIGHTH ANNUAL MEETING, LOUISVILLE, KENTUCKY, MAY 9-10-11, 1917.

The next annual meeting of the Kentucky State Dental Association will be held at Louisville the three days previous to the Kentucky Derby, May 9, 10, 11, 1917. Address all correspondence to W. M. Randall, Secretary, Louisville, Ky.

MISSOURI STATE DENTAL ASSOCIATION.

The fifty-second annual meeting of the Missouri State Dental Association will be held in St. Joseph, April 4, 5, 6, 1917. Some of the strongest men in the dental profession will present papers upon the live topics of the day, and a full clinic program will be given which will keep you busy thinking for months of what you can use in your patients' mouth for his best interests and welfare.—J. F. WALLACE, Secretary, Canton, Mo.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN, 140 THE FENWAY, BOSTON.

Gentlemen:

The trustees and director of the Forsyth Dental Infirmary for Children wish me to inform you that at their last meeting (October, 1916), a new department was inaugurated, to be known as the Library and Museum. In an institution composed of so many various departments one is apt to overlook the importance of this branch of dental progress. The Library and Museum should be the safety vaults in which to preserve the results of experiments and discoveries which are daily being made at this institution. The permanency of the building itself should symbolize to us the permanency of our work, for we build not for the present alone, but for future generations; and we likewise look backward as well as forward and profit by the work and discoveries of those who have preceded us in our profession.

Here at the Forsyth we have the greatest dental clinic in the world, with a staff of operative dentists which is unsurpassed. Why can we not likewise have the best library and museum of its kind? We can. But we need your help. At present we have the neuclus of a dental library, which we are planning to develop as fast as possible. Most of the books which we need are purchaseable; but past editions of dental journals, etc., we cannot buy. We therefore ask you to contribute to the library any past volumes of dental journals, etc. (for which permanent recognition will be given), and solicit any information from you which would lead to the securing of any old volumes of interest. We ask you also to report all oral abnormalities, to save for us any unusual structure, etc., so that we may be able to preserve them in the museum. For these specimens also, permanent acknowledgment will be given. In short, your co-operation is earnestly requested to make this department the best of its kind in the dental world.

Any suggestions will be gratefully received, and information will be gladly furnished.

Respectfully yurs,

FREDERICK A. KEYES, D. M. D.,
Librarian and Curator of Museum.

IMPORTANT INFORMATION REGARDING THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

The Annual Meeting of the Dental Protective Association of the United States, was held at the Palmer House, Chicago, Illinois, on December 18, 1916, at 4 P. M. A brief synopsis of the meeting is here given for the benefit of the members who were unable to attend in person.

The treasurer, Dr. D. M. Gallie, reported that the total assets of the Association were $35,617.04. Of this amount, $26,000 is in approved municipal bonds, $4,000 in Harbough notes, secured by collateral notes, as reported at our last annual meeting, and the balance in cash in a savings and checkng account.

It was reported last year that Dr. A. F. James, of Chicago, a member of the Association in good standing, had been sued by Cassius M. Carr for an alleged infringement of a patent. Since this time Dr. Thomas B. Hartzell, of Minneapolis, also a member of the Association in good standing, has been sued by the same party, and on practically the same grounds. We quote from the report of the attorney for the Association, Mr. P. B. Eckhart, of the law firm of West and Eckhart, regarding these suits, both of which are being defended by the Association: "During the past year your attorney's activities for the Association have been for the most part, directed toward the preparation for trial of the two patent suits brought against members of the Association. These cases are now ready for trial. One of them will likely be disposed of without trial so far as the Association's interest in it is concerned. On Tuesday, December 12th, the United States Court sustained our motion to dismiss the bill for lack of jurisdiction. Upon the merits of the case we expect to be able to defeat the claim of the patentee. It is interesting to note that a decree by default against an eastern dentist who had neglected to procure an attorney or pay any attention to the suit, was entered in a patent suit brought in Chicago by the same claimant. This decree cannot be used as a precedent against us, howover, and it is doubtful whether it has any validity by reason of certain defects in procedure."

A matter of importance to the members is an intended change to be made in the by-laws of the Association by the Board of Directors. According to the by-laws it has been necessary to mail a notice of the annual meeting to each individual member. Inasmuch as there are no annual dues to be collected, and inasmuch also as only a few members attend the annual meeting in person, it seems to be a needless expense and entails unnecessary labor on the part of the officers, who are not compensated for their services, to send this individual notice. This matter was discussed and it was agreed by all present that a notice in the Journal of the National Dental Association, and all other important journals, should be sufficient; that it was generally understood that the annual meeting of the Association is always held on the third Monday in December, at 4 P. M., in Chicago. The Board of Directors accordingly will make this change in the by-laws, and all members should take notice and govern themselves accordingly.

The work of the Board of Directors for the past year was ratified by the Association by a unanimous vote; and the present Board was re-elected for the ensuing year.

By order of the Board of Directors:

J. G. Reid, President.
J. P. Buckley, Vice-President and Secretary.
D. M. Gallie, Treasurer.

OBITUARY.

GEORGE HAMPSON LIEPART.

George Hampson Liepart, D. D. S., died at his residence, 207 North Elmwood avenue, Oak Park, Thursday, December 7th, 1916, after a long illness.

Dr. Liepart was a graduate of the Chicago College of Dental Surgery, year 1904. He practiced on the West Side until four years ago, when he moved his office to Oak Park. He had a large circle of friends in both communities. Dr. Liepart was a member of the National Dental Association, the Illinois State Society, The Chicago Dental Society and a faithful worker in the West Suburban Component. He was a member of Oak Park Lodge No. 540 A. F. & A. M., and Lodge No. 141 I. O. O. F.

Dr. Liepart is survived by Mrs. Liepart and four children, Elizabeth, Gertrude, George H., Jr., and Laura.

The funeral was held at the residence Sunday afternoon, December 10th, Rev. Arthur Hoffman of the Eighth Presbyterian Church, Chicago, conducting the services; burial at Oak Ridge.

In the passing of Dr. Liepart, the community has lost one of its noblest characters, and the profession a competent, conscientious member.

T. E. T.

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THE RELATIONSHIP OF ORAL FOCI OF INFECTION TO SYSTEMIC DISEASES.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO.

It is not possible in the short time allowed for a paper of this sort to go into the scientific details of a subject of this nature, such as the title surely well deserves. I therefore must ask my hearers to forbear with me if I am not quite as explicit with reference to certain phases of the subject as I might be if time and space were of no consideration.

The conclusion that the human mouth is an excellent incubator for pathogenic germs and at times performs a significant part in the production of various bodily disorders has in the last few years become stronger in the minds of physicians and dentists as well. That the constant presence of deleterious microbes (particularly those of the pus-producing varieties), in the oral cavity, must of necessity have detrimental effects, not only on the eliminative organs (as the kidneys, liver, intestinal tract, and skin), but on other organs as well, which are reached by these toxins and germs, carried there by the circulatory apparatus, is a well established fact. No one, I think, at the present time, will dispute this assumption. Drs. Rosenow and Billings claim to have conclusively demonstrated the direct and serious results of mouth infections on the valves of the heart, and many other earnest workers, including Medalia (Professor of Bacteriology at Tufts Medical College), claim to have demonstrated concomitant diseases frequently found closely linked to or positively produced by oral infections. Professor Medalia, in particular, has shown the tremendous improvement in conditions such as rheumatism, boils, furuncles, interstitial nephritis and acne following the use of autogenous vaccines given for the treatment of alveolitis in conjunction with these diseases. Personally, I have had quite a number of most interesting experiences along these lines, which bear out to a large extent the theories and results Medalia mentions. That is, the autogenous vaccines made from the mouth in these cases of alveolitis have shown marked beneficial results, not only in regard to the oral condition, but by improving general constitutional conditions as well. Such results may be interpreted, at least clinically, as fairly efficient proof of an interrelationship of these conditions. Of course *such* proof does not justify us, at this time, to accept "prima facia" the positive statement so frequently made, that a *direct* interrelationship of systemic diseases to oral foci of infection has been conclusively and scientifically proven, but it *does* seem that we may accept this theory, at least to the following extent: Oral foci of infection *have* a decided *influence* on general health and diseased conditions located beyond the oral cavity. Many medical scientists in their writings, besides Hunter, Goadby, Rosenow and Billings, insist upon this *direct* relationship and etiology quite definitely. That the absorption of pus germs or their toxines through the lymphatic system from the mouth and throat is of a nature *favoring* the development of adenitis and lymphatic tumors, is a well established fact. Acute and chronic polyarthritis are infections well within the possibilities of being considerably *influenced* by oral foci of infection. This is definitely claimed to be the *actual and productive* cause by Judson, Donald and Medalia. Alveolitis, pyemia and septicemia is another combination which has been dwelt upon in our literature to a considerable extent, and the *primary* cause of these systemic disturbances laid to these oral infections.

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* Read before the Odontological Society of Chicago, January 2, 1917.

To grasp the situation a little more clearly, it might be well to divide the question of oral foci of infection into two different categories, namely, first, such, arising from alveolitis (osteomyelitis, pyorrhea, Rigg's disease) and secondly, those which can be included under the heading blind abscesses. As to alveolitis and its infectious possibilities, a word regarding the anatomical relationship of the area involved may be of interest. This is a disease which in its inception, in the majority of cases, is started by a slight traumatism. There may possibly be other causes which as yet have not been conclusively demonstrated. At any rate, the usual first manifestations are mild inflammatory conditions, possibly reaching the pus stage, and which are later perpetuated by the deleterious influence of the pus-producing micro-organisms. Miller, Galippe, Hunter and others have shown these pyogenic germs to be constantly present in these infections. The pneumococcus (also in chain form), the staphylococcus aureous and albus are practically always present, and very frequently the micrococcus catarrhalis and various forms of other pyogenic bacteria. The proportion in which these different organisms occur is very uncertain. Naturally, the question of immunity plays a big role in the development of these chronic infectious diseases. In our circulatory fluids immunity is represented by the presence of various antibodies, and of these the ones interesting us most in this connection are those which, when present, will prevent the growth of pus-producing organisms. These antibodies may develop strongly against a certain group of bacteria and at other times against an entirely different type. In other words, they are selective. If at the time of primary infection of the gingivæ the degree of immunity or opsonic index should be low against pneumococcus or streptococcus, a full fledged case of alveolitis might be expected to follow. The battlefield for these germs is the medullary space in the maxillary bones holding the teeth, commonly known as tooth sockets, and in the ligamentous attachment of the teeth. As to another phase of susceptibility to disease, I should at least mention the influence of altered reaction of the oral fluids and of the blood, but to cover that subject thoroughly would cause me to go into extensive research in the study of the effect of this reactional phase, requiring a minute understanding of the enzymotic action of the phagocytes, namely, their activities in relation to leukoprotease versus lymphoprotease. In fact, in studying the etiology of alveolitis and its effects, so many matters enter into the field of research that if we care to take up the study of these conditions in a really scientific manner it becomes almost bewildering. That these open pockets around the necks of teeth harboring in great quantities constantly, freshly created virulent organisms may readily cause other infections or seriously tax our antibody fighting machinery by virtue of the products being constantly swallowed and being swept across our tonsils and other lymph nodes, and it being likely that they are absorbed by the small capillaries and lymph vessels about the necks of the teeth, seems rational. While such secondary infection has not in a scientific manner been definitely proven, the avenues of access, together with the fact that autogenous vaccines from the primary seat of infection seem to affect *both* local and general conditions beneficially, would appear to permit us to accept at least this much of these theories: That *some* oral foci of infection have a decided *harmful influence* on general bodily health.

As to blind abscess; considered from an anatomical standpoint, such abscess is a small sac ranging from the size of a pinhead to that of a coffee bean. The walls of the sac are made up of dense fibro-elastic tissue. They are quite thick and the sac is filled with a purulent exudate containing a suspension of bacteria. According to the views of Thomas Gilmer, the prevalent organism contained therein is the streptococcus viridans. The space for this sac at the root end of the tooth is, of course, in health not present, but is produced by absorption of bone cells, thus forming a bone cavity for the seat of the abscess. The causes of these blind abscesses are usually poorly filled roots of teeth, or roots of teeth in which the canals have become infected. Again I must not omit to at least state that these very abscesses may be caused by organisms carried to the site through the blood stream and may be secondary themselves. The strange feature and great differential point about such abscesses compared to the ordinary alveolar abscess is that they are both caused by similar infectious procedures, the one developing into a large abscess filled with virulent pus which usually finds its way out through the bony wall of the tooth socket into the soft tissues, emptying itself either through the mucous membrane of the oral cavity or finding an exit at some other point following the road of least resistance. There is severe pain, local swelling, and general fever, chill and malaise; while with the blind abscess the conditions are vastly different. This is a chronic affair, and notwithstanding its presence for years and years, it creates little or no local symptoms and is only found to be in existence when the X-ray is used for the purpose of determining in pictures the conditions present about doubtful root ends.

Unfortunately, it has become among physicians quite a prevalent idea that the diagnosis of blind abscess from X-ray films is a very simple matter and a great many erroneous diagnoses have thereby been made. The meaning of darkened areas found in X-ray photographs about the root ends of teeth may suggest a variety of conditions, and must not empirically be decided upon as abscess. The very fact that drugs and chemicals which are used in the process of devitalization and in the treatment of root canals by dentists, are frequently strong escarotics and coagulants, render it quite reasonable to suspect, as a consequence, that a great many of these dark shadows are nothing more than coagulated lymph, in the lymph spaces and in the periapical space about the root end, and frequently, therefore, are not at all expressions of pathological conditions or blind abscess. There are many other conditions that on X-ray pictures very closely simulate blind abscesses; I would therefore caution my medical confreres to leave the diagnosis of affections about the root ends of teeth expressed in X-ray pictures to those who may be better qualified and are more familiar, not only with the pictorial expressions, but with the anatomical structure, the history and symptomatology, however slight the latter may be.

The likelihood of blind abscesses about the teeth being foci of infection, although generally claimed to be such, is to my mind not nearly so clearly scientifically established as a fact, as is the probability of alveolitis being a source of oral focus of infection. Clinically, the results achieved by the removal of these blind abscesses in such cases in which their association with other bodily diseases are thought to be the primary source of infection are not strikingly encouraging. Beneficial results after their removal in infectious diseased conditions in association with them are found not nearly as frequently, nor as spontaneously, as in the removal of more superficially located foci of infection, such as are found in alveolitis pockets then associated with general disorders. I do not wish to belittle the possibility of these blind abscesses as being injurious foci of infection, but I am not at all convinced that these or similar foci of infection are responsible *directly* for other secondary infections; notwithstanding the fact that they are frequently found in association with arthritis, endocarditis, colicystitis, and a hundred other diseases. It is certainly a fact that they are even *more* often found in the mouths of patients who show *no* expression of *any* systemic disturbance at all. Rosenow has carried on a good many interesting experiments along the lines of proving such foci of infection to be *directly* responsible for certain diseased conditions, and while I am a great admirer of his wonderful knowledge and skill, I am not convinced of the correctness of his findings. To take the contents, for instance, of these abcesses (or from other oral foci of infection), cultivate them in the laboratory on artificial media, and then to inject a syringe full of an emulsion obtained therefrom into the abdomen of an animal, with the result that the animal shows arthritis, endocarditis, etc., is to my mind no proof whatever that such a relationship exists in the human body, where conditions are *entirely* different from any of these described in his experiments in the laboratory. In the mouth these abscesses are created very slowly and are usually of many years' standing and contain organisms of a very low degree of virulency. If, in the course of time, organisms or toxins are then very gradually passed out into the system, through a very circuitous route, I grant that they *might* set up a low grade secondary infection (not any special disease). It would, however, appear to me that this very gradual infiltration of toxic material *should* produce a greater tolerance and also an inhibitory antibody production. The possibility of the infectious nature of all foci of infection is so great, however, and dentists in general should do all in their power to prevent the creation of such foci, and if present should use their skill to promptly remove them.

In conclusion: I believe that these foci create a low grade secondary infection, which permits other infection easily to obtain entrance and a firm hold on the individual. I doubt, however, that these foci of infection contain organisms *directly* responsible for *distinct* secondary infectious diseases. I believe that the toxins and organisms absorbed from pus surfaces in the mouth may so undermine the resistive power of the organism in general, that it is laid open to easy infection and that these oral foci thereby create a condition favorable to the development of other diseases. I believe that the use of autogenous vaccines as recommended by Medalia, tends to overcome this *low grade secondary infection* and *thereby* gives the system a chance to recover from other infectious diseases present, and I think that the great variance in the beneficent results from autogenous vaccines given in these cases, lies in the fact that the vaccine obtained does *not* contain the particular organism which on account of its selectivity produced the particular bodily disease present. The vaccines produce their good results by the fact, that they contain *such* organisms as have prepared the way, by previously breaking down general barriers, so that the real harmful agent could have full swing, and that by the removal of these primary foes which broke down these resistive barriers and thereby again allowing the general antibody productive power of resistance to rise, the *real* organisms of the disease can be handled by the natural antibodies present in an individual no longer lowered in general vital resistive powers.

In the numerous cases which I have observed clinically, I find myself more and more convinced of the fact that none of the various oral foci of infection contain distinct organisms which are *per se* responsible for distinctive general disease, and that autogenous vaccines, even if obtained from these foci of infection, do not by themselves produce cures, but render the individual more amenable to future treatment. It is surprising how quickly and thoroughly individuals whose vitality has been wrecked and lowered by infectious oral conditions, respond to the removal of these foci of infection. Patients complaining of malaise, headaches, insomnia, digestive and nervous disturbances, express themselves as feeling tremendously improved in general health after scientific treatment of their teeth, gums and surrounding structures by competent dentists.

To my mind the presence of oral foci of infection produce as a result of their presence a low grade secondary infection generally, and lower the host's opsonic index to various infectious organisms, but do not *per se* cause the occurrence of distinct bodily diseases. Their prompt removal is frequently followed by a rapid return of vital resistive power to the individual, which resistive power may be accelerated by the addition of autogenous vaccine treatment in such cases where physicians deem it advisable to bring about a more rapid change to the normal and removal of any low grade secondary general infective process. It is a wise precaution in treating these infectious foci when present in connection with other bodily disturbances to preserve a live culture of the organisms pending the determination whether a vaccine is to be made or not, as after the focus is removed it is too late to procure a serviceable culture. To procure original culture material for such vaccines the methods employed must be very carefully carried out in the most up-to-date thorough scientific manner.

THE TREATMENT AND FILLING OF ROOT CANALS.*

BY EDGAR D. COOLIDGE, D. D. S., CHICAGO, ILL.

For several years mouth conditions leading to infection both local and systemic, have occupied a large part of the thought of the dental profession. Many startling statements have been made during these years which seemed almost incredible at first, but now much is accepted as established fact. We have been through the period of extreme conservatism of saving teeth which after treatment were doubtless a menace to the health of the patients as long as those teeth were retained. In past years we pitied the poor, who, because of unfortunate circumstances, had to have their teeth extracted, while today we have the opportunity of pitying others, the more fortunate, shall we say, who were not compelled to have their teeth extracted which were diseased, and who are now filling our hospitals, while there are hosts of others who suffer, but are not confined to hospital care.

No more significant statement has been published than that made by the Chairman of the section of stomatology of the American Medical Society, in his address at Detroit, in June, 1916. The radiographic mouth examinations of 498 cases of chronic arthritis in the Presbyterian Hospital, show evidence of chronic aveolar abscess, from small rarefied areas to large areas of bone destruction in 89 per cent of them. Another group of patients with other systemic disorders, excluding arthritis, show chronic aveolar abscess in 74 per cent. A third group of patients in private medical practice show chronic aveolar abscess in 69 per cent. This record makes one hold one's breath and wonder what per cent of one's work of the past is safe to leave standing today. Is it not well that we stop and consider the vital relation of this work to the future health of our patients? Is it right to continue in the same routine as in the past and simply have a hopeful and optimistic view of the future, excusing hurried and imperfect work by saying you have not heard of any of your patients having rheumatism, arthritis, or any of the systemic infections? The only way to know is to radiograph every bit of root canal work of the past, that comes along, and draw your conclusions, which will be decidedly different from those made without radiographs.

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* Read before the Chicago Dental Society, November 21, 1916.

At the outset, I wish to say that it would be hard for anyone to improve, who is convinced that improvement is not necessary, since one's past work has not come back with discharging abscesses or dicomfort to the patient. These symptoms may never occur, and yet much trouble may come to the patient.

There is a hinge upon which the whole situation in the improvement in root canal work turns, and that is the attitude of the operator to the importance and value of this work, for the patient will look upon it as directed by the operator. The patient can appreciate this vital relationship between poor root canal work and poor health, as much, or more than the operator if that relationship is explained, and they are entitled to know what they are purchasing. Therefore, the attitude taken by the profession is bound to be, to a very large extent, the attitude of the patient, and the dentist who fails to value his services and demand a just recompense for his time spent in any service will do well to take a course in business as well as dentistry. The quality of service rendered must always be the basis for recompense and when better service is rendered, better recompense should be expected.

That there is an upward trend in this work, there is no doubt, for no subject could receive the attention this has, and is receiving today, without leaving its effect, and that effect is a great uplift, but there is still need of more time and thought and work on this great subject, and less seeking after "sure cures" and "short cuts."

Preventive Treatment: Now that we realize more fully the importance of properly filled root canals and the difficulty encountered in filling them, we appreciate the value of a vital pulp even more than before. Every effort to preserve the vitality of the pulp should be made, and more frequent examinations of the teeth for caries should be made.

Where bridge work is to be constructed, radiographs should be made of the teeth to be used as abutments and where there are crooked roots and other conditions present which hinder or prevent perfect root canal filling, a method of attaching should be used which will not demand removing the pulp of the tooth. We must use careful and deliberate judgment in every case, to prevent going to an extreme in our attempt to keep live pulps and having them die under fillings and crowns, or advocating crowns upon teeth which cannot be properly prepared to receive a crown without endangering the life of the pulp, or attempting to place crowns on such teeth and omitting some of the necessary preparation, which later will cause an equally "unfortunate condition," chronic gingivitis.

Conditions Presenting: Four conditions present for our consideration.

First, the vital pulp, which must be removed for some good reason. The reputation of the present methods of root canal treatment and filling will depend upon the success of our efforts with these teeth more than any others. We have the entire responsibility in these cases placed upon ourselves. We have a clear field without obstacles common to root canals having had previous operations upon them. Asepsis and thoroughness should be our motto, and nothing short of the most perfect fillings possible to make should be allowed to stand.

Second, radiographs show many canals partly filled with no evidence of infection or tissue destruction around the apex. It is a problem in many of the cases to decide whether they should be disturbed or allowed to remain. The history of the patient in regard to other teeth previously treated, and as to the general physical condition, may be helpful in determining the procedure. Where fillings or crowns are required, it is a safer method to refill the roots also as there will be less danger of future trouble. Radiographs of some of these canals show open space beyond the fillings, which is always a positive factor in determining that retreating and refilling are necessary.

Third, there are many roots of teeth showing definite rarefied areas around their apices. We have been told by those who have followed the bacteriology in these cases, that it is not so much the quantity of infection present that is so dangerous, as it is the type and virulence of the bacteria. Therefore, these teeth may be as injurious to the health of the patient as those showing larger areas of absorption. Dr. Weston Price has stated that by no present method of treating can all bacteria of the rarefied area about a root end be destroyed. Should we then conclude that all teeth showing these rarefactions should be extracted? I am sure this would be too radical to recommend and would prove disastrous if carried to an extreme. In a hospital case or a bed-ridden patient where treatment is impractical or impossible, such methods must of necessity be resorted to, but for those patients physically able to present for treatment most of these cases can be cleared up by removing the old filling, treating and refilling. Some of these cases when followed by radiographic record, after completion of the treatment, may still show a rarefied area, and resection of the apex followed by thorough curettement should be performed.

Fourth, there are many cases showing definite areas of absorbed bone, which of course include a loss of many, if not all of the apical fibres of the peridental membrane. Many of these should be extracted for there is considerable doubt as to the cure of such large bone lesions where a considerable amount of the cementum is denuded. Regeneration of bone may take place, but a denuded and pus soaked cementum does not afford a suitable surface for attachment or permanent apposition of new tissue. Where it is practical, the root may be retreated and refilled, followed by resection of the apex and denuded portion and the cavity curetted thoroughly.

There is no place in the field of dentistry where more careful diagnosis and keener judgment is required, than in determining the condition present and prescribing the course of treatment. Many difficulties enter to confuse one in making a diagnosis from radiograph, and more than one radiograph should be taken of any doubtful area or condition. It is difficult to get a single picture to show all the roots of an upper molar to their apices, and many times the natural bone cavities, canals and foramina, are confused with areas of absorption. It is hard to see the outline of some of these bone lesions where the outer plates of bone are dense and the absorption area is entirely between the two plates since the shadow of the outer plates alone will be nearly as dense as where the inner portion of bone is healthy.

Asepsis in Root Canal Operations: Asepsis, not antiseptics, has become the byword of modern surgery. As we look back in dentistry a few years, we recall many things of common practice which would seen ridiculous today. Who would want to have root canals treated today without the rubber dam, or have cotton wrapped upon a broach with unsterile fingers and then put into the wounded tissue in one's tooth, or to have any instrument or material used which would not be safe if used in the treatment of any wound of the body? I am sure I would not. Only a few years ago, one of the members of this society, Dr. J. P. Buckley, advocated more sanitary methods of treating root canals before this society and many arguments were made in the discussion that followed to show how impractical it all was and how unnecessary, but his good work has gone on, and we have adopted those ideas and many others. Everything should be done for asepsis in root canal operations that should be done for any surgical operation. Materials and instruments should be prepared with the greatest of care and nothing used in the canal which has been touched by the fingers. There are suitable sterilizers for materials as well as instruments, and no office should be without these necessary articles. Dry heat sterilizers are best adapted for materials such as cotton, absorbent canal points, gutta-percha points, dressings, etc., and phenol or lysol are excellent for broaches. Formaldehyd cabinets are convenient for keeping the instruments and materials in when sterilized and not in use, but it is not suitable for the entire sterilization of any of them. It is convenient and sanitary to have a tray in a formaldehyd sterilizer removable, and use it to contain all the root canal materials and instruments to be used in the operation, placing it on the operating table while the work is carried on. This is a habit that commends itself to any observing patient.

The hands should be carefully cleaned just as the operation is to be begun, but nothing should be put into the canal of the tooth which has been touched by the fingers. The field of operation should be isolated, washed with alcohol and painted with iodin, to insure against carrying any foreign material into the pulp chamber and introducing infection there.

Technic of Cleaning and Enlarging Root Canals: The first requirement to good results in root canal filling is to obtain sufficient access to the canal openings that they can be seen by reflected light easily and that they may be entered without working around a prominence of tooth structure. The canals that usually are small and difficult to enter are also curved as well; the root does not pass in a straight line parallel to the long axis of the tooth. These canals are the buccal canals of upper molars and mesial canals of lower molars, upper first bicuspid canals and often lower central, lateral and cuspid canals. It is often possible to eliminate at least one curve by a generous cutting into the mesic-buccal cusp and mesial marginal ridge of molars, a generous cutting bucco-lingually in bicuspids. When the importance of this first step has been impressed upon the mind of every operator to get the desired results there will be more than 100 per cent improvement in the following work.

The difficulties encountered in opening canals are so great that one's patience is often exercised to full capacity, so every detail that affords any advantage should be carried out. In extending the walls of the pulp chamber it is best to preserve the natural contour of the subpulpal wall, which usually leads toward the mouth of each canal.

The operating tray before us should contain every instrument to be used and this means everything available for this work. A number of small porcelain trays can be used to contain the short broaches and the S. S. White aseptic medicine tray is especially suitable for containing phenol and alcohol, so that each time a broach is used it can be passed into phenol, then into alcohol. This detail is a very safe precaution.

Selecting the smallest (XXX fine) smooth broach, it should be carefully worked to the end of the canal. This may be difficult, but it is very important as it gives one the direction and length of the canal. If a broach is used which will not pass to the end of the root it will bind and pack the pulp and debris farther into the canal, or else it may refuse to follow the canal and make a detour into the dentin which seldom leads back into the canal again. If a broach is first selected which will pass to the foramen and the canal enlarged throughout its entire length with the aid of 30 per cent sulphuric acid until the next size broach can be used in the same way, much difficulty will be avoided, and more perfectly filled canals will be the result. It is a progressive performance of this same technic, using always a broach which will pass to the foramen until the canal is enlarged sufficiently to fill.

I find the Kerr pulp canal file to be one of the most useful of canal instruments. I might say that for me it has come nearer solving the problem of opening canals than any other instrument. All broaches should be used without turning them around and around in a canal. They cannot follow a curved canal and be turned without breaking, so should be made to cut by drawing them back and forth like a file. It requires several hours of time spent at several appointments with a patient to clean and enlarge a small canal until it is ready to fill. Ward's sodium and potassium is sometimes very helpful in dissolving out pulp stones and calcified material, but it is dangerous to use in canals which are open to the foramen. It is an exceedingly strong caustic, and should any pass through the foramen, much harm will result. Whenever sodium and potassium is used it should be carefully neutralized with sulphuric acid and then the canal washed with sodium carbonate solution.

Radiography: The first time the radiograph is needed is before devitalizing to determine whether it is possible to fill the root. If the privilege were always given us of choosing the teeth to be treated much difficulty would be avoided. However, we are more often called upon to remove old fillings and treat diseased pulps than we are to remove healthy ones. Frequently a radiograph at the beginning will save difficulty and embarrassment. A tooth having had previous treatment will often have a piece of broach lodged in the canal, and it is always better to locate such obstructions before beginning an operation.

The next time the radiograph is of great value is when an obstruction of any kind is met with which prevents the broach from passing beyond a point. It may be that the broach is headed in the wrong direction, that it has failed to make a turn, and often a radiograph of a tooth with a pin in the canal will aid the operator in passing around the curve and put him on the right track again. Growing impatient and using a drill or twist broach in such cases usually increases the difficulty and lessens the possibility of getting to the foramen.

When the canal has been cleaned and enlarged it is always well to radiograph it to prove up the work and to get the measure of the length of the root as an aid in filling. The measurement wires should always be cut to extend to the full length of the crown and root, so that when the radiograph is finished the wire may be placed upon it to compare the length of the shadow and the pin to show the amount of distortion of the picture. This point is of more use to the operator than can be impressed by the simple statement. The measurement wires should be placed in safety for future reference while filling the canal. It is difficult to pass a broach into a canal as far as the foramen every time and no farther, so it is well to bend a broach to the exact length of the canal to serve as a guide.

It is needless to say that the radiograph is necessary at the completion of the canal filling, for it then becomes a matter of record to be preserved. Yet every operator will find he has occasionally failed to completely fill a canal and a refilling becomes necessary.

Filling the canal: Now we are put to the final test and one upon which depends to a very large extent the future health of the apical tissue. If our operation has been performed up to this point with carefulness in regard to asepsis and the health of the apical tissue is unimpaired, we can yet spoil it all unless the canal is completely and aseptically sealed. No canal can be completely sealed by placing a long cone of gutta-percha into it and attempting to pack the part remaining in the pulp chamber. The technic of filling canals with gutta-percha worked out by Dr. Callahan, called the "Callahan method" from coast to coast of this country, is one by which the operator can be assured of filling all the open space in a root canal no matter how curved or tortuous it may be. In canals where the apical foramen is very small or cannot be penetrated by a broach, this method of dissolving cone after cone in the chloroform rosin solution by pumping the cone up and down in the canal filled with the solution until it has become filled with a dense plastic mass, and finally packed down with pluggers, is a method unexcelled. However, many canals have open foramina through which this solution of chloropercha will be forced in increasing quantity as the operation continues, so that when completed and excess is left in the apical tissue which causes some troublesome pericementitis.

A very large per cent of canals can and should be enlarged until a number 34 canal plugger will pass within two millimeters of the foramen. Now with the exact length of the canal taken from the measurement wire and marked upon the number 34 canal plugger, preferably by making a sharp bend at that point, the plugger is tried in the canal while the process of enlargement or curettement is going on until it will pass to within two millimeters of the apex of that canal. When this has been accomplished the canal should be dehydrated with alcohol and acetone, then slightly moistened with eucalyptol. Now we have a canal thoroughly clean and open sufficiently to allow our plugger to pass within two millimeters of the foramen. All the space to be filled beyond the plugger must be estimated from our measurements and radiograph. A short piece of gutta-percha cone the proper size should be selected, about three millimeters long, and attached to the end of the plugger by heating the plugger. The space to be filled might be entirely filled by the cone; however, it is advisable in most cases to carry a small drop of thin chloropercha to the apex on a smooth broach to insure filling all the open space. The plugger carrying the three millimeter cone is passed into the canal to the market place and the cone packed into the canal.

You will readily see that this reduces the uncertainty of canal filling to a minimum, since the amount of space to be filled by guess is so small. Should the amount of gutta-percha carried on the plugger be sufficient to fill to the apex, the excess can only be a portion of the drop of chloropercha used which is not enough to cause severe pericementitis following the operation. The remaining part of the canal is of little consequence if the foramen has been sealed properly by the first piece of gutta-percha. The operation is continued by carrying short pieces in the same way into the canal and packing them down each time. When the canal is full it should be sealed with a hot burnisher and radiographed.

Summary: The consideration of the subject of root canal treatment and filling is one that must always affect the great majority of our profession. All the work can never be done by specialists in this branch of dentistry although there is a splendid opportunity for many to devote their time to it exclusively. Every operator must assume the responsibility of the root canals he fills, and as he studies this situation more he will not be satisfied with underfilled or overfilled roots, nor will he be satisfied with anything less than surgical cleanliness in this work. The health of the apical tissue must be considered of the greatest importance to a healthy individual and every operation from pulp removal to the completion of the filling of the root should be carried on with this object in view of maintaining or restoring health to this tissue. In carefully considering this thought, it will be found necessary to refuse to remove pulps from some teeth when radiographs are taken previous to operating. Caustics and strong antiseptics should be used with the greatest care if used at all. It must necessarily occupy a considerable amount of time and patience to properly clean and fill molar root canals, but it is a problem that must be met by every one who is doing this work. There are hosts of patients coming for service of this kind daily expecting immunity from future infection. Perfectly and aseptically filled root canals are the safest protection against future alveolar abscess and in a great many cases present rarefied areas will fill up completely and give a clear radiographic record after a short time following such treatment.

IS THE CAUSE OF SO-CALLED PYORRHEA ALVEOLARIS CONSTITUTIONAL?

BY EARLE H. THOMAS, M. D., D. D. S., LL. B., CHICAGO.

The purpose of this paper is to bring together for your consideration a few facts regarding localizations of various general diseases and conditions, with the underlying thought that pyorrhea, likewise, may be the localization of some general or constitutional pathological condition.

There are very many conditions spoken of as pyorrhea but the term, wherever used in this paper, refers to that condition, only too well known to all of us, in which we see, when the lips are retracted—swollen gums with rounded margins, absorption of more or less alveolar process, that peculiar bluish color to the tissues from the margin of the gums to a definite line which extends horizontally around the jaw on a level with the middle third of the roots of the teeth, and that peculiar characteristic dark red color to the tissues beyond this band of blue. I specifically exclude that form of gingivitis, in which calcareous deposits have encroached on the gums causing a fiery red inflammation without pockets or pus. Some of you will at once say that this latter is the first stage of the first mentioned condition, but I have only time now to say that I differ with them—they are two separate and distinct pathological conditions. The one is manifestly local in origin but I will endeavor to show in this paper that it is quite possible for the other to be the localization of some general condition.

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*Read before the "Dental Review" Club" of Chicago, January 9, 1917.

When a person is ill and goes to a physician, he is given some medicine to help his particular ailment. Does the physician pick the first drug off the shelf to give to the patient? No; he picks out a certain one that applies to the case in hand. Why? Because different drugs have different actions on different parts or structures of the human body. Some drugs deaden the nerves while others make the nerves more irritable and responsive; some drugs stimulate the respiration while others stimulate the heart and circulation; some drugs irritate the stomach and cause emesis while others soothe the stomach and prevent vomiting; some drugs cause blood-vessels in certain areas to dilate while others cause them to contract, and some drugs cause diarrhea while others cause constipation; etc.

Not only is this localization manifested by drugs—Rosenow and others through their researches show that various bacteria, when injected into the general bloodstream, will pick out particular parts of the body to localize in and the same bacteria, grown under the same conditions, will almost always localize in the same organ when injected in different animals. Dr. Wm. H. G. Logan has spoken of a peculiar case of parotitis in a dog which was about to have pups. Before they were born the dog was killed and the same kind of bacteria as were found in the parotid gland of the mother were found in the parotid glands of each one of the offspring, demonstrating again the conditions that I am endeavoring to impress upon you this evening.

This tendency to localization found in drugs and in bacteria is also found in the toxins of the various diseases to which the human body is heir. And does not this seem logical? A toxin formed by or in the tissues in disease is a chemical substance the same as is a drug. I quote from Brundage's Work on Toxicology: "There seems to be an affinity on the part of certain toxins for certain tissue cells."

The balance of my paper is divided into three parts:

Part I. General diseases *with* localizations excluding those in the mouth.

Part II. General diseases *with* localizations in the mouth.

Part III. The classic forms of stomatitis and their relation to general constitutional conditions.

In each of the conditions that I enumerate I want it kept in mind that I have entirely avoided all manifestations caused by local extension. Every condition that I will mention is a generalized toxic condition with a localized action of the toxic or poisonous material in some special part of the body, and as you listen to each reference to a localization I want each one of you to say to yourself, could pyorrhea possibly be an analogous disease, a localization of some constitutional condition?

PART I. GENERAL DISEASES WITH LOCALIZATIONS EXCLUDING THOSE IN THE MOUTH.

We will first take up a few of the *skin diseases.* In erythema multiforme, caused by general constitutional conditions such as the absorption of intestinal toxins, we have an eruption usually occurring on the face, neck and dorsal aspect of the extremities. In erythema nodosum, also with constitutional etiology, we have the eruption often limited to the surface of the skin overlying the tibia. In erythema induratum, with a similar constitutional condition as a cause, we find deep seated nodules occurring mostly in the calf of the leg. Pompholyx consists of vesicles or bullas usually limited to the hands and feet, while psoriasis is manifested by an eruption occurring mostly upon the extensor surface of the limbs—yet the underlying cause in both of these conditions is constitutional. Acne rosacae occurring on the nose and cheeks mostly, and acne varioliformis limited usually to the forehead and scalp are also caused by constitutional conditions; the former frequently following the continued ingestion of alcohol over a lengthy period.

Next, diseases of the blood itself. In simple anemia and chlorosis we have a pallor of the fundus of the eye, the arteries are pale and tortuous, the veins are enlarged and there are hemorrhages into the retina. In pernicious anemia we find a pallor of, and hemorrhages into the retina. In leukemia there are hemorrhages into the retina and there is a peculiar, distinctive form of retinitis present. I will mention localizations in the eye quite frequently because, in the first place the eyes are so sensitive that by far the greater number of localizations occur there, and in the second place, with ophthalmoscope we can look directly into the eye and see the internal structures. However, the point to bear in mind always is, why should anything happen in the eye—there is no local injury of any kind to the eye to affect it.

Now, diseases of the kidneys. In chronic nephritis, so-called Bright's disease, the first symptom noticeable is an edema of the lids with chemosis (a bulging of the conjunctiva), and upon viewing the interior of the eye through the ophthalmoscope we find a distinctive inflammation of the retina—the albuminuric retinitis. We also often find a localized neuraliga present in this disease. In uremia, a toxic condition of the blood caused by the accumulation of urea, we find dilated pupils and amblyopia (dimness of vision) without any determinable changes in the retina.

In hysteria—a purely functional nervous disease, there is an amblyopia sometimes amounting to total blindness. There may also be scotomata (blind spots in the field of vision), photophobia (a hypersensitiveness to the action of light), blepharospasm (a spasmodic contraction of the orbicularis polpebrarum), and monocular doplopia (double vision with one eye). These affections usually affect one eye only.

I will not take the time to even mention the various diseases of the nervous system in which the symptoms localize where the disease localizes in the central nervous system.

Now the ductless glands. In myxodema and cretinism, caused by a lessened secretion of the thyroid gland, we find usually a swelling of the eye lids, inflammation of the optic nerve with a consequent dimness of vision, and sometimes an interstitial keratitis (inflammation of the cornea). In exophthalmic goitre (Grave's or Basedow's disease), caused by a hyper or perverted secretion of the thyroid gland which is discharged directly into the bloodstream, we have a peculiar set of symptoms manifested around the eyes—exophthalmos (a bulging of the eye from its socket), an abnormal widening of the palpebral aperture, failure of the upper eyelid to normally follow the eyeball when the patient looks down, imperfect power of convergence of the eyes and an interference with normal winking.

Regarding pathological localizations of physiological conditions peculiar to women—in vicarious menstruation we may find hemorrhages into the retina and vitreous and also subconjunctival hemorrhages. In pregnancy there may be present a peculiar gravidic retinitis which may threaten the sight of the mother to such an extent as to justify premature delivery of the child. In prolonged lactation (suckling) there may appear paralysis of accommodation in the eyes, asthenopic symptoms (weak or painful vision) and even corneal ulcer.

Now, the digestive system. Dyspepsia and chronic affections, by interfering with nutrition in general, may cause asthenopia, weakness of accommodation, and heterophoria (tending of the visual lines away from parallelism). The absorption of septic material from the stomach and intestines, principally the latter, often causes iridocyclitis and choroïditis (both inflammation of the internal structures of the eye). The straining associated with constipation sometimes causes hemorrhages into the conjunctiva.

Next the liver. In some diseases of the liver we have asthenopia (weak or painful vision) and weakness of accommodation. In catarrhal jaundice we sometimes find spider angiomata appearing in the face and lasting a few months. In suppurative angiocholitis (inflammation of the bile-ducts) there developed in one case a parotitis on the left side.

Coming to diseases of the circulatory system, we find in valvular heart disease and in fatty heart, hemorrhages into the retina. It might be mentioned here that the retina is the only place where we can actually see the conditions of the blood vessels and these hemorrhages would not be discovered were it not from the use of the opthalmoscope. Could not the same hemorrhages occur in the gums without our knowing it and later cause unexpected lesions? And likewise in endocarditis in which there may be given off from the heart valves hundreds of infected emboli causing pyemia and septicemia?

In arterio-sclerosis we may find in the eye hemorrhages and edema of the retina, and we can actually see, by use of the ophthalmoscope, an increased tortuousity and perivasculitis of the vessels of the retina and a condition in which the arteries press on the veins where they cross each other, causing an enlargement of the veins distally to the contact between the two, which is a condition that is a direct parallel to passive hyperemia of the pulp caused by the arteries pressing on the veins at the apical foramina. Aneurysm of the aorta, through its pressure and consequent irritation of the cervical sympathetic ganglion sometimes is the cause of mydriasis (dilatation of the pupil), enlargement of the palpebral aperture, and exophthalmos (bulging of the eye ball). However, if the pressure is sufficient to cause a paralysis of the ganglion, the result is myosis (contracted pupil), ptosis, (drooping of the upper lid) and enophthalmos (a sinking in of the eye ball in its socket).

Next we will take up the effect of a few *drugs* on the human body when taken internally in large or poisonous doses or when absorbed through occupational contact or otherwise. In chronic alcoholism we often find acne rosacae, a chronic congestion of the venules of the cheeks and nose with an associated skin eruption. Methyl (wood) alcohol when taken internally has a special predilection for the retina and optic nerve and may cause total blindness in twelve to forty-eight hours. The over use of tobacco may cause middle ear disease, tinnitis (ringing in the ears) and retrobulbar neuritis (inflammation of the optic nerve). Retrobulbar neuritis may also be caused by poisoning with alcohol, wood alcohol, iodoform, lead, arsenic, carbon disulphide and nitrobenzol. Middle-ear disease tinnitis, and often nosebleed occur from poisoning by quinine, aspirin and salicylic acid. Belladona and atropin cause dryness of the skin and a scarlatinal rash. Arsenic and phosphorus may cause a nettle rash on the skin which in arsenic poisoning may be papular, vesicular or pustular and may result in keratosis of the palms and soles.

It must be remembered in this connection that chronic poisoning by arsenic may occur by grinding arsenic in mills, by inhaling the vapor of smelting copper, from handling or manufacturing certain wall papers, etc., and from various uses in the arts. It is a constituent of many insecticides, used to destroy vermin and various weeds, in stuffing birds and animals, to improve the coats of horses and also for various preservative purposes. In England there was at one time an epidemic of arsenic poisoning through drinking contaminated beer. It also occurs as a contamination in some face powders. I go into detail here to show you how a person may have arsenic poisoning and not know how they got it—the same may be true of many other drugs. Is it not logical to think that pyorrhea might possibly be the result of a chronic poisoning of some kind as yet unknown?

Lead poisoning may occur from contaminated drinking water and it has a special disposition to attack the musculo-spirial nerve first, paralyzing it and causing the typical wrist-drop. Why should it pick out this nerve first and not touch any of the other thousands of nerves in the body? Administering curare will cause a paralysis of all voluntary muscles. Mercury causes mercurial eczema, a typical skin eruption, as does also the administration of large doses of the bromids and iodids. Picrotoxin, found as an adulteration in beer and a constituent of "Knock-out Drops," causes a scarlet fever like rash, and an acne is caused by antimony and emetin. A measles-like rash is caused by antipyrin, and in iodin poisoning we have swelling of the eyelids. In pilocarpin poisoning we find a tearing pain localized in the eyeballs. In sulphonal and trional poisoning we get papular skin eruptions, and in certain food poisonings and in serum administration, we sometimes find a nettle rash or scarlatina-like reddening of the skin. Gelsemium causes disturbances of vision, pain in the eyes, dropping of the upper lid and sometimes a dropping of the lower jaw, the result of paralyzing the masseter muscle. Resorcin causes an increased contraction of the masseter muscle with the resulting clenching of the teeth. Potassium cyanid causes convulsions which, though they may be general, usually attack only certain groups of muscles. Through its effect on the masseter muscle it sometimes causes a true lockjaw. The loss of the palate reflex is the first symptom of a patient under the influence of bromids. In nux vomica and strychnin poisoning we find a peculiar involvement of the buccinator muscle causing "Risus Sardonicus"—a peculiar grin with the corners of the mouth drawn back, and with later, symptoms of a true lockjaw.

Other drugs causing an eczema-like eruption of the skin are phenol, cardol, cinchona, croton oil, curcus oil, sulphonal, tar, and poor quality vanilla. Other drugs causing a nettle, scarlatina or measles like rash are—antipyrin, atropin, belladona, copaiba, chloral, cubebs, iodin, hyocyamin, morphin, quinin and antimony.

Some drugs when taken internally seem to localize their effect upon the salivary glands causing a greatly increased secretion or a lessened secretion of saliva. Among the former are mercury, copper salts, picrotoxin, colchicum, coniin (hemlock), iodin, potassium cynanid, digitalis, muscarine (from mushrooms), pilocarpin, ammonia, antimony, arsenic, cantharides, cystisin, nicotin, physostigmin, sapionin and sanguinaria (blood root) which latter causes a very severe salivation.

Some drugs when administered internally show their localized excretion in the saliva. With mercury we have an acrid metallic taste, with antimony, iodin and the tin compounds we have a metallic taste. We have a copperish, metallic taste from the copper salts and a garlic taste from phosphorus.

Next let us consider some of the general infectious diseases and their localizations. In cerebro-spinal meningitis (fever) we have purulent inflammation of the conjunctiva and choroid, edema of the eye lids, paralysis of the eye muscles, abnormalities of the pupils, retinal hemorrhages and inflammation of the cornea and of the optic nerve. The fifth, seventh and eighth are the nerves usually involved—the muscles of the neck become stiff and there occurs a paralysis of the muscles of the face. Herpes of the lips occurs in this disease almost as frequently as in malaria and pneumonia. In cholera we have shrinking of the tissues of the orbit, bluish circles under the eyes, dullness and ulceration of the cornea and sometimes suppuration of the parotid gland. After diphtheria we sometimes have paralysis of accommodation, of the extrinsic muscles of the eye, and of the palate, with the occurrence also of inflammation of the optic nerve. In gonorrhea we sometimes find an iritis and one type of conjunctivitis—both analogous to gonorrheal arthritis—the infection being caused by metastases through the blood of the bacteria of their toxins. In influenza, depending upon the marked depression following it are found inflammations of various parts of the eye and herpes of the lips. In malaria we have inflammation of the cornea, optic nerve and other parts of the eye—paralysis of accommodation and hemorrhages into the retina. In malaria we have also herpes of the lips, this occurring almost as frequently as in pneumonia. In morbilli (measles), the eruption occurs first on the face. We have also opaque white spots on the mucous membrance of the lips, inflammation of the conjunctiva and margins of the lids with resulting hordeolum or stye, and sometimes ulcer of the cornea. In mumps we sometimes have an associated edema of the lids, chemosis, and a special liability to orchitis in the male. Mumps sometimes follows injuries or diseases of the abdomen and pelvic organs. In broncho-pneumonia the cheeks are cyanosed and pale and diarrhoea is usually present, while in lobar pneumonia the cheek on the same side is generally flushed, constipation is usually present and there is almost constantly herpes of the lips. In relapsing fever we have inflammation of the internal structures of the eye. In general tuberculosis we find hematogenous infection of different bones of the body—

usually the vertebrae, causing kyphosis or humpback. In rubella (German measles) there is early enlargement of the cervical lymph glands, and the rash appears first on the face. In glandular fever, a general infectious disease of children, there is a swelling of the lymph glands of the neck, posterior to the sterno mastoid muscle. An almost diagnostic sign of syphilis in the second stage is the early and almost constant swelling of the epitrochlear lymph glands. In twenty-five per cent of the cases there is inflammation of the iris. In the second stage we also find periosteal nodes or swellings on the tibia. In inherited syphilis there occurs an interstitial keratitis (inflammation of the cornea) in the majority of cases. In the second stage of syphilis the part of the eye ball usually affected is the anterior segment, while the posterior segment is affected more often in the teriary stage. In the tertiary stage necrosis of various bones occurs but the septum of the nose and the hard palate are involved first in the majority of cases. In the scrofulous or strumous diathesis there is a predisposition to many common diseases of the anterior portion of the eye. In yellow fever we have conjunctival congestion, subconjunctival hemorrhages and also retinal hemorrhages. In whooping cough there occur subconjunctival hemorrhages and hemorrhages into the lids and orbit as a result of the paroxysms of coughing. In varicella (chicken pox) and variola (small pox) we find vesicles and pustules on the conjunctiva and lids, with sometimes ulceration of the cornea. In scarlatina, scarlet fever, typhus and typhoid fever we find conjunctivitis, hemorrhage into the retina and ulcers of the cornea. In septicemia and pyemia there occur retinal hemorrhages and sometimes septic emboli lodge in the interior of the eye causing purulent inflammation.

We will next take up a few diseases under the head of *Miscellaneous Diseases and Conditions*. In diabetes there occurs paralysis of accommodation and of the extrinsic ocular muscles, hemorrhage into the retina, cataract, inflammation of the iris and optic nerve, and changes in the state of refraction of the eye. We also find neuralgia, gangrene, and an increased susceptibility or lowered resistance to infection. Perforating ulcer of the foot often occurs in diabetes. In gout we have neuralgia, inflammations of various structures of the eye, hemorrhages into the retina and sometimes a peculiar marginal ulcer of the cornea. In rheumatism we may have inflammation of nearly all the structures of the eye with sometimes a paralysis of the extrinsic ocular muscles. In rickets, occurring mostly during the first two years of life, caused by a diet too rich in farinaceous food and deficient in calcium salts, and therefore treated by a diet containing fresh animal proteids, we find inflammation of the cornea and conjunctiva of the eye. In scurvy we have hemorrhages into the retina and a peculiar night blindness. It will be remembered that this disease is also caused by a lack of certain substances in the diet. In chronic pleurisy we have occasionally a remarkable vasomotor phenomenon—flushing or sweating of one cheek or dilation of one pupil. In rabies (hydrophobia) we have swollen protruding tongue, salivation, and convulsions occurring first in the throat and remaining localized here for a considerable length of time before appearing elsewhere. Lastly in tetanus (lock jaw) where the toxins alone, as a rule, are absorbed into the blood, the spasms occur first of all in the masseter muscle.

PART II. GENERAL DISEASES WITH LOCALIZATIONS IN THE MOUTH.

Under this division of the paper I will endeavor to bring together practically every disease and condition of any importance in which, though the causative factor is general, that is, circulates throughout the whole body in the blood, yet there is a local manifestation of some kind in the mouth. Part I of the paper having endeavored to impress upon you the peculiar fact of the localization of general diseases, Part II, following, will point out the frequency with which a localization of a general condition actually does occur in the mouth.

Referring to diseases of the *blood* itself again, we find that, according to Osler, pyorrhea is present in practically every case of pernicious anemia. In myeloid leukemia we have bleeding of the gums and in lymphatic leukemia we have present hemorrhages into and from the mucous membrane of the gums, mouth and palate, with very often an accompanying ulcerative stomatitis.

Referring to the kidneys, we often have hemorrhages from the mucous membrane of the mouth in chronic nephritis. In uremia we find salivation, swollen tongue, difficulty in swallowing and in mastication, and a peculiar uremic stomatitis with a swelling and erythema of the gums.

Taking up *Nervous Diseases,* we may have manifested around the mouth various conditions including bleeding from the gums in Hysteria; in neuresthenia we may have imaginary or real pains of various kinds, and in both Hysteria and neuresthenia we have a predisposition to almost any disease about which the patient may worry. Neuralgia may localize in one particular tooth without any known local cause. In spasmodic laryngitis, a purely nervous affection of children, the gums may be swollen, red, and painful. Certain neurotic individuals have a recurring herpetic stomatitis sometimes even pemphigoid (with bullas). In Raynaud's disease, a vascular change not organic but of nervous etiology, we often find a passive hyperemia or a persistent ischemiä of areas of the mouth. In angio-neurotic edema, an hereditary transient yet periodic nervous affection, the lower lips may become very much swollen. In facial hemiatrophy we have wasting away of one side of the face, with also an involvement of the alveolar processes on the same side to such an extent that the teeth become loose and drop out. In tabes dorsalis (locomotor ataxia) we may have trophic changes manifested in the mouth in the form of perforating ulcer of the cheek.

Next we will take up *Diseases* of the *Ductless Glands.*

In myxodema and cretinism, caused by a lessened secretion of the thyroid gland, we have delayed dentition and early decay of the teeth. In infantilism, caused by a perversion of the secretion of the pituitary gland we sometimes find a total absence of the second dentition. In Addison's disease, usually caused by tuberculosis of the adrenal glands resulting in a lessened secretion, we have a pigmentation of areas of the mucous membrane of the mouth. In acromegaly, caused by a hypersecretion of the pituitary gland, there occurs an enlargement of all the prominences of the face, especially noticeable being an elongation of the lower jaw with an associated widening of the alveolar processes and separating of the teeth.

Peculiar to women are found hemorrhages from the mucous membrane of the gums and mouth in vicarious menstruation, and in nursing women there is often a variety of ulcerative stomatitis starting in the mucous follicles of the lips and cheeks.

Diseases of the *Digestive System* again. In acute gastritis we sometimes find herpes on the lips and vesicular stomatitis. Herpes often occurs in chronic gastritis and there is usually also a hyperemia of the tip and margins of the tongue. In gastric and duodenal ulcer we sometimes find an associated parotitis. In obstructive jaundice there are hemorrhages from the mucous membrane of the mouth, an irritating itching of the skin and the formation of bright, red telangiectases (dilatations of capillaries), about one centimeter in diameter on the tongue and lips. In acute yellow atrophy of the liver (malignant jaundice), one form of which is caused by delayed chloroform poisoning, we may have severe hemorrhages from the mucous membrane of the mouth. One case of hypertrophic cirrhosis of the liver, with no discoverable etiological factors, had bleeding of the gums for over a year. An associated salivation is sometimes found with cysts of the pancreas, and in all severe diarrhoeas and inflammations of the intestines, there is dryness and redness of the mucous membrane of the mouth.

Taking up the effects of *Drugs:* In lead poisoning there is usually an associated neuralgia and nearly always the blue lead line to be found on the margin of the gums. In conjunction with this there is often an ulcerative stomatitis resulting in sloughing of the gums with necrosis and loss of the alveolar processes. Preservatives containing salicylic acid often cause poisoning which is characterized by bleeding from the mucous membrane of the mouth. This hyperemia and bleeding is present also in poisoning by aspirin, atropin, belladona and quinin. Phosphorous poisoning is characterized by a marked tendency to hemorrhages from the mucous membrane of the mouth followed by a severe ulcerative stomatitis with marked sloughing of the soft parts and necrosis of the bones and processes. In chronic arsenic poisoning there is usually a hyperemia of, and bleeding from, the mucous membrane of the mouth. Hydrogen sulphid when inhaled over a lengthy period even in small quantities will cause bleeding from the mouth. Poisoning by ptomains will cause a dry mouth with hyperemic and swollen gums. Nitro-benzene poisoning causes the mucous membrane of the mouth to assume a darkened color. In opium and morphine poisoning there is sometimes a loosening of the teeth, and in poisoning by cantharides there appears on the mucous membrane of the mouth numerous small, clear vesicles. In poisoning by the copper salts there is a greenish blue discoloration of the gums and there appear dark lines on the gum margins in poisoning by bismuth and silver compounds. In poisoning by mercury, which often occurs through its administration in the treatment of syphilis, we find the well known symptoms of metallic taste, a marked stomatitis and pericementitis, difficult mastication, dark bluish red gums which are spongy, sore and swollen, enlarged and painful salivary glands with increased secretion, and finally an ulceration of the gums with resulting necrosis of the underlying process.

Referring again to the *General Infectious Diseases:* In measles (morbilli) we find on the mucous membrane of the mouth and especially of the cheeks—Koplik's spots twenty-four to forty-eight hours before the appearance of the exanthem elsewhere on the body. These are rose red papules of infiltration with superimposed bluish white minute vesicles. Following this there occurs a distinct punctiform hyperemic rash on the mucous membrane of the whole mouth constituting a stomatitis which is very often followed by gangrenous stomatitis resulting in cancrum oris and death. In German measles (rubella) we have rose colored papules of discoloration on the mucous membrane of the mouth, but contrary to measles, this is never followed by gangrenous stomatitis. In Rocky Mountain spotted fever and in the plague, we have hemorrhages from the mucous membrane of the mouth and gums, as is also the case in yellow fever. In dengue, an acute infectious disease of the tropics, we have an inflammation of the mucous membrane of the mouth, in ephemeral fever it is common to find herpes on the lips, and in milk sickness it is usual to find the tongue swollen and tremulous with little local trouble elsewhere. Sprue, a form of tropical diarrhoea with many relapses and usually anemia and wasting, has associated with it a peculiar inflamed, ulcerated and exceedingly sensitive condition of the mucous membrane of the mouth and tongue. In tuberculosis there is practically always a hyperemic condition of the margin of the gums which, in a considerable number of cases, results in real pyorrhea. In the second stage of syphilis there is inflammation of the fauces with sharply defined mucous patches, condylomata and painful ulcers on the mucous membrane of the mouth. In both varicella (chicken pox) and variola (small pox) there occur vesicles on the mucous membrane of the mouth which become sore and swollen and sometimes bleed. In typhus fever we may find as a complication cancrum oris, and in typhoid fever there may occur severe ulcerative stomatitis with adhesions of the palate and tongue to the posterior pharyngeal wall. This condition may even extend to the periosteum causing bone necrosis. In scarlet fever we have the typical strawberry tongue with a rose colored or vivid red punctate eruption over the mucous membrane of the mouth. In the malignant form there may occur abcesses, sloughing of the mucous membrane of the mouth, tonsils and throat, and even perforation of the soft palate or cancrum oris.

Under the heading of *Miscellaneous Diseases and Conditions:* In diabetes we often find the saliva scanty, the tongue red, dry and glazed, a follicular stomatitis and redness and swelling of the gums. In rickets we have delayed dentition with stunted, defective enamel which is easily eroded, resulting in deep concavities in the tips of the incisors. In practically all conditions of starvation in babies we find the mucous membrane of the mouth and tongue hot, dry and inflamed. In scorbutus (scurvy), a disease caused by a diet lacking in fresh foods, we find the gums red, sore and swollen with bleeding at the least touch. They finally become spongy and ulcerated, the teeth loosen and fall out, and there may be actual necrosis of the jaw. In infantile scurvy (scurvy rickets), a disease common among children of the well-to-do classes and caused by the lack of fresh animal food, the giving of the advertised proprietary baby foods, and boiled milk, we have soreness and hemorrhages from the gums, and if the teeth have appeared the gums become spongy, bleed easily and the teeth become loosened. In erythraemia, a disease characterized by persistent increase in red blood corpuscles, we often have bleeding from the mucous membrane of the mouth. In purpura rheumatica there is often found a severe inflammation of the throat with sometimes necrosis and sloughing of the uvula and palate. In purpura hemorrhagica there may be severe hemorrhages from the mucous membrane of the mouth without any swelling of the gums. And lastly, in morbus maculosis neonatorum, a disease occurring in the first week of the life of an infant, there may be bleeding from the mucous membrance of the mouth sufficient to cause death.

PART III. THE CLASSIC FORMS OF STOMATITIS AND THEIR RELATIONS TO GENERAL CONSTITUTIONAL CONDITIONS.

Acute catarrhal stomatitis is a usual concomitant of indigestion and of the specific fevers.

Herpetic or follicular stomatitis, found mostly during the second year, is a complication of pneumonia, gastro-intestinal troubles and other infectious diseases. It also bears some relation to that obscure nervous derangement associated with herpes found elsewhere in the body.

Ulcerative stomatitis, in which the gums become inflamed and ulcerated followed by sloughing and necrosis of the process, is found as a complication of certain metal poisoning, scurvy, blood dyscrasias especially acute leukemia, diabetes, chronic nephritis, the exanthemata, and many wasting diseases.

Parasitic stomatitis or thrush, although the exciting cause is a fungus, only occurs as a concomitant of gastro-intestinal disturbances and cachetic states.

Cancrum oris, noma, or gangrenous stomatitis, usually occurring in the first seven years of life and often resulting in death, only occurs following a wasting or prolonged disease usually diphtheria, scarlet fever, measles, typhoid fever or whooping cough.

And lastly, mercurial stomatitis, which as you all know occurs following the administration internally of mercury past the point of tolerance.

Now, gentlemen, the long and tedious ordeal of listening to this array of facts is over. Stated briefly, my conclusion from them and from clinical observation of the occurrence of the disease is, that the suggestion of the constitutional cause of pyorrhea should not be ignored, that it is quite logical to think that pyorrhea may be the localization of some constitutional condition.

PRIMODENTISTRY AS RELATED TO MODERN DENTISTRY AND PREVENTION.*

BY OSCAR HAMMER, D. D. S., SAINT LOUIS, MISSOURI.

In ancient dental history, about the time of Hippocrates, some mention is made of the finding of a pair of leaden forceps. These evidently were to be used in the extraction of loose teeth, as there is also some mention made of the treatment and extraction of loose teeth, in ancient dental literature. These forceps, it appears, were found in the temple of the Delphian Apollo. This is surely true that they were used for the extraction of these loose teeth in the permanent set, and possibly not even intended for the extraction of the primary teeth, as it may be assumed that in these ancient times these temporary or deciduous teeth eliminated themselves by a natural process on account of their more thorough use in crushing the coarser food and also by the same reason of a more natural developmental process in the arches of the mouths of children.

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*Read before the St. Louis Dental Society, December 5th, 1916.

Modern civilization, however, requires modern methods, and not always now are the primary teeth roots absorbed as. sad as it may seem in many cases, the teeth are not used to the extent that nature intended.

This is doubtless due to the methods and preparation of food and feeding, and also to the character thereof, as this, in many cases requires no considerable mastication.

It is well known that the use of an organ tends to develop it, and as the deciduous teeth are, by nature, only temporary organs and should be lost by the natural process of absorption of the roots, it is evident that if they are not being lost in this way it must be because they are not being used, and consequently the development in the process and development or natural progress of the corresponding permanent tooth is not erupting or forcing outward or upward as it should. Therefore, for your consideration we shall dwell a moment or two on what seems to be a possible subject of the times, and one that will, and in fact always has been before us as a matter for observation and discussion.

Primodentistry that branch of dental science which embraces the consideration of the "Primary teeth"; more generally known as the "Deciduous or temporary teeth," and also known by many other names, all misnomers, is beginning to make its place as the fundamental or paramount issue in that great scope in modern dentistry, the rigid enforcement of prophylactic measures, or oral hygiene and conservation; and well it may when we take into consideration all that it is and all that it means.

Each month the various dental journals together with the other many good and valuable phases of dental literature, practical hints and information, contain much that is of interest, yes valuable interest, in the light of oral hygiene, that means so much for the maintenance and healthful conditions that lead to comfort and happiness. Dentistry is endeavoring to persuade the human race in these modern times away from ignorance, fear, and prejudice.

Dentistry has done and is doing more—in the advocacy of the care of school children's teeth we make a long stride towards prevention, not only in imperfections that may arise in the human mouth, but disorders caused by faulty mastication are being overcome by this same means of prevention and removal of the cause. So much then from the dental viewpoint. Physicians and parents we will assume, take proper antiseptic care of the mouths of children during the period of what is known as infancy, but we are now confronted with the conditions in the child's mouth during that important time between the age, of let us say, two years and six years. We are, and have been advocating oral hygiene amongst school children who are from six years and upwards, and we are reasonably assured that the mouths of babies are properly taken care of as mentioned above; it therefore falls upon the primodontist's responsibility to go still further in the care of the oral conditions than in the mouths of school children; we are compelled to give care at the earliest possible age, and further still it may be said that dentist and physician should consult during the period of dentition—without going into the technique or treatment in these cases at this time, it is sufficient to mention the importance thereof.

Reverting a brief moment to the period in a child's life before the arrival at school age, say between the ages of one or two years and six, then is the time parents should use the utmost care in instructing children in the necessary steps toward mouth cleanliness, assuring against future dangers, in a measure at least, and surely by this same care are instilling in that child's life a valuable habit, that afterwards becomes in the very nature of the child.

At this age, or let us say at the time when all or nearly all the primary teeth are in place, provided they have erupted normally as the rule of appearance or at least nearly so, since we are never certain as to the time of eruption, and are compelled to conjecture to a large extent; this is the age at which a change is going on in the child's physical condition; this is the age when the child is partaking of more solid food, eating differently let us say, and surely should at this very time be taught how to eat as has been expressed, chew,—chew,—chew,—therefore frequent examinations of the primary teeth and their surroundings should be made during this period. The teeth should be cleaned or smoothed by the dentist in charge and any slight defects that are easily detected during these procedures, are readily corrected, avoid more painful operations in future by this means of prevention, simple in its nature though of valuable importance.

Now if we expect a child to properly masticate food we should by all means endeavor to keep the organs that are to perform mastication in the best possible condition from a mechanical as well as prophylactic viewpoint, and that can best be obtained by proper correction and advice at the earliest possible time, as aforementioned, and with a little co-operation on the part of the little patient, parents and the dentist.

Lectures and instruction in Oral Hygiene to school children if properly appreciated, is a work along humane lines, that is, in the large sense of the term, and it shows a tendency towards progress, giving children the benefit thereof. If we expect the children of now as they advance in years to the time when they are called upon to do the battle of life, then we should equip them with the greatest and foremost requisite, and that is health. This we can do best by inculcating in children the recognition that prophylaxis is but a means to a larger issue, prevention.

In the primary or deciduous teeth, we usually find as in the permanent set cavity decay, broken teeth, and the various other pathological conditions, together with the accidents that are likely during childhood.

These diseases and mechanical defects should never be permitted to exist any longer than is absolutely necessary, they should be corrected at the earliest possible moment. By this means and by often making thorough examinations and by occasionally smoothing these teeth, we enhance the virtues and benefit of oral hygiene, a help to humanity, if we expect to improve the human race, and make mankind healthier and happier. Therefore, from a strictly prophylactic consideration, not one diseased, decayed, or broken deciduous tooth should be left to remain without proper attention. When every effort has been used to restore the teeth to a useful function by proper treatment, filling and the like, and the efforts fail, on account of having been by neglect already too far decayed or broken, they should be extracted at the earliest possible time, but when this premature extraction is necessary, the space should be maintained with the application of a proper mechanical device. Where the tooth is badly broken it is expedient at times to cleanse roots and fill them, thus keeping the space; in these cases, however, the tooth is ground down to the gum or nearly so, and all rough surfaces removed, so food debris does not accumulate and permit fermentation, etc.

Accumulations, deposits, and rough surfaces should never be allowed to remain. Removal thereof is one of the first factors to be dealt with, therefore constant effort must be used to avoid their further development.

Mouth-washes and dentifrices should be chosen or recommended that will meet the requirements and demands of the individual case at hand, and should never be recommended promiscuously, or without thorough investigation and test; as sometimes in a given case the simple use of water and prepared chalk is very efficient, while at times a combination of other ingredients is required. Also the use, and it should be urged, the proper use of the tooth brush must never be left out of the daily programme of home care.

In these modern days of dental advancement, it is being recognized more and more by the dental surgeon that the primary or first teeth must receive the same care and attention as the permanent teeth. We are aware that they are provided by nature for the definite purpose in the development of the maxillaries, that they are the positive means of mastication, that they give and develop facial expression, also they are a definite factor in phonation, and without them and their proper care in every way, health cannot be maintained in its fullest degree; neither can it be expected that the development of the child will continue to the wholesome economy that we expect, as the stomach of a child that is affected by mal-conditions in the oral-cavity is a much overwrought organ and is directly affected thereby, not to mention the other organs indirectly hampered, all by improper mastication.

It is generally becoming recognized, in fact has always been known, that defects in the eyes, ears, nose and throat together with other afflictions in different organs of the human body, are a direct cause of much delinquency in school children. It is therefore reasonable to assume that the defective conditions in children's teeth are also a contributing factor, hence the early correction and prevention cannot be too urgently advocated, and from a dental standpoint as well as from every other point of view we do well to begin on the deciduous teeth to get the best results.

During the past few years, the attitude of parents and the public generally, has become more favorable toward the large scope of prophylactic instruction, and especially oral cleanliness and attention thereto, and also to the general welfare of children's mouths. Parents long blind to the issue involved in the importance of the primary teeth are allowing their indefinite knowledge and misconception regarding them disappear; and this is as it should be.

Parents are unqualifiedly in favor of all that is good for their children, and therefore the teaching of oral hygiene is revealing to their children much that tends to prevention, and what they themselves have perhaps missed along these lines will never occur with their children. Experience has cost too dearly as there is less excuse for neglect now than there has ever been, and neglect in these matters is therefore the child's misfortune indeed and not their fault. In after life the child will be benefited or will suffer according as it has been given attention or as it has been neglected.

It is claimed sometimes by dentists, that children are very undesirable patients, very hard to manage and to do successful operations for them is almost impossible. That is in a way true, nevertheless, it is greatly exaggerated, at least in the writer's opinion. It must be observed that we are all confronted with adult patients who are nervous, always under a high tension and very difficult to reason with and hard to wait upon, and therefore the troubles in this regard are proportionately no greater amongst children than in adults, and the only plausible argument is that it must be done. Of course there are some impossibilities, and they will no doubt sooner or later be overcome by the same methods as we are compelled to overcome neglected conditions which are caused by the two great handicaps, fear and ignorance. These, however, are gradually dis-appearing with the improvement in modern dentistry, by the time saving mechanical devices and methods, also improvement in local anasthesia, safe and scientific obtundents and the like, and that greatest gift to humanity, anesthesia, by nitrous oxid gas.

In this brief script it is not intended to localize or confine the virtues of oral hygiene to merely the mouths of children, as this rich innovation to mankind, always known, and advocated since the adent of modern dentistry, but being more rigidly and strictly urged during the past few years is for every individual, old or young, and must be sought by all who would enjoy the greatest possible comfort.

Then if we would eliminate from mankind the fear usually associated with dental operations, we must first begin during childhood, thus leading them into wholesome and healthful habits that form a part of daily duty. That is why the care of the primary or deciduous teeth or primodentistry becomes the dominating issue in oral hygiene.

Thus oral hygiene enters into each branch or department, in the field of dentistry, or reversing it, each branch builds toward the standard of prophylaxis. In the operative or restorative, in the mechanical or reconstructive, as it is also in the therapeutic or curative, each step is made along lines that tend towards conservation.

Observing further we are compelled to note that it is grossly erroneous to allow pulpless condition of the primary teeth to exist any longer than is absolutely necessary, as also with abscesses especially those of a chronic nature of long standing as we know by this time that the toxic poisons are not only disastrous by their entrance into the stomach, but that these also follow certain blood streams and are rapidly absorbed in the system with their well known disastrous consequences. This is as real a factor in the child as it is in the adult. Also at this particular time or age, under normal conditions the permanent tooth correspondingly is developing or forming from a second papilla. This is forming in a secondary dental groove, which is closing from without inwardly, a sort of pulp now taking the form of a tooth, and as the crown of a tooth is formed first it is pressing up and naturally absorbing by pressure the tissues above. And at this same time calcification is being completed in this second organ. Now these abscess conditions or root end infections should be corrected at as early an age as is possible, while they may have no effect upon the crown of the permanent tooth if they occur after the development of the enamel is completed, they nevertheless are decidedly dangerous when the child is very young and during the process of calcification of the permanent tooth. Of course we may imagine that when they occur at the age of six or seven years, they would not have as disastrous an effect as when they occur at three or four years, sometimes younger; and we know that they do occur at a very young age in some cases, especially when there is a marked lack of attention. We will not go into the causes and effects of other conditions, such as simple cavity decay; especially the ill results of proximal cavities. Neither will we discuss at this time inflammation of the pulp, active or passive hyperemia or congestion of the nerves.

It is useless also in this course to repeat the oft stated declaration of evil results coming from the early extraction or too long retention of the primary teeth. Their disastrous results are found in the effects of mal-formation of the permanent teeth in after years. But reverting a moment or two to the consideration of prophylaxis in the mouths of children, we find as an excellent remedy the recommendation of Dr. D. D. Smith of Philadelphia: "Patients are required to present themselves at least once a month, when each tooth is individually subjected to a vigorous cleaning and polishing on every surface by the use of wood points and pumice." The results are said to be excellent, doubtless brought about by the decreased tendency of foodstuffs to lodge on highly polished surfaces. This method the writer has found to be an excellent procedure with children and especially during the period while the permanent teeth are in the process of eruption, thus taking care of the permanent teeth as they are coming into the mouth and incidentally also keeping the remaining primary teeth in a perfectly clean and wholesome condition.

Then, finally it is obvious that to gain the best results, we must commence even earlier than the school age to correct these already existing defects or to prevent them if they do not already exist, insofar as is possible, giving children as near as we can ease and poise; hence there must be a difference in the realm of mentality in the child not handicapped by these physical defects.

PATHOLOGY AND TREATMENT OF THE INVESTING TISSUES OF THE TEETH.*

NEWTON G. THOMAS, M. A., D. D. S., CHICAGO, ILL.

When the outlines of this subject loom before me, writing becomes a near impossibility. All that I know concerning it seems so little compared with the demands of the theme that I wonder why I consented to discuss it. I felt certain then, and do still feel so, that it was not intended that I should write a very general pathology of the tissues mentioned, but rather, limit myself to the inflammations and suppurations commonest to those tissues. If the truth were known, and a suggestions from the honored chairman of the program committee implied as much, the particular disease that frequents our offices, disturbs our dreams and causes the "doctors to differ" was meant for my presentation, Chronic Suppurative Pericementitis. Both, the subject given and the one implied, are much too big for this hour.

Perhaps nothing related to dentistry has caused more discussion in the past few years or has given rise to a more extensive literature than suppurative pericementitis. Still we are asking, "what definitely is its cause, and what is its cure; is any technique or medicament equal to the emergency of this disease?" Men of high professional standing and indisputable integrity make striking claims and announce appealing possibilities while the profession at large seems to be waiting for an enchanted formula to be placed at its disposal, a specific for its cure.

Over against the questions suggested and the announcements made, opposing the empirical claims and denying the various results proclaimed, in the midst of this Babel of discussion are others, basing their conclusions upon biological principles and the histological characters of the involved tissues, pitting miscroscopic observation against macroscopic observation. It has seemed to me that the empiricists have the larger audience.

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*Read before the North Branch of the Chicago Dental Society.

In the presentation of my subject, I prefer to present to you some of the structural characteristics of the tissues involved, to emphasize those effecting most the possibilities suggested and claims made, and to allow you to draw your own conclusions. I do not pretend to tell you anything new but to call to your minds some of the things that in the crush of your daily cares you perhaps have forgotten.

It would be impossible to properly present a treatise upon the investing tissues of the teeth, a treatise involving the pathology and treatment, without giving consideration to the cementum. This tissue is too closely associated with the peridental membrane for weal or woe to be ignored. The relationship between the two is so intimate, they are so completely dependent upon each other that they must be discussed together. Once a very dear friend of mine in a work of his, referred to each of these tissues as "the most important of dental tissues," a remark not to be countenanced in a text-book but scarcely overestimating the importance of either. To aid us in future reference, let us mention some characteristics of this structure. It is a highly specialized tissue closely resembling bone in structural content, being most like subperiosteal bone in the arrangements of its elements, yet differing from bone in some very important respects. Its lamellae are by no means regularly placed nor are its lacunae so consistently arranged as in bone. It does not change its form as does bone and most important of all it has no such a blood supply. It is physiologically passive depending upon agencies outside itself for its own growth and repair. It is permeable by fluids and when such fluids are infective and necrosis has resulted it cannot protect itself as does bone by the formation of a sequestrum and by exfoliation. Also, under such circumstances, remembering the irregular placement of the lacunae, scraping of the roots to obtain a healthy structure makes at best a discouraging prophecy. Such a tissue architecture must be a successful agent in the maintenance of chronic infection.

As dependent upon the peridental membrane for existence and growth, and all but as important in its relation to the teeth is the alveolar process. A recent publication refers to it as "an appendage of the teeth." It is formed in response to the eruption of the teeth and is removed physiologically when the teeth are lost. As the process is called into being by the arising need of the fibrous elements of the peridental membrane so when for any reason these elements of the membrane are destroyed, the process is removed. The alveolar process is built to accommodate the teeth in whatever position they assume, a fact never lost sight of by the orthodontist, and when a tooth is lost or from any cause a break occurs in the peridental membrane, of the fibres attached to the process, the process in that area is removed. This leaves the axiom apparent that no alveolar process remains over a root or part of a root where there is no peridental membrane.

Now we will consider briefly the soft tissue that surrounds the tooth root, filling the space between the root and the alveolar walls and extending occlusally from the crest of the process to the crest of the gingivae. This tissue, best termed the peridental membrane, contains in its structure the fibres that support the tooth in its masticatory service and the specialized cells that build both cementum and bone as well as those which upon occasion cause absorption of either. Not only because of its important function is it interesting, but because of its liability to injury. Except to a limited degree, like other specialized tissues, it is unable to repair itself if it has been long affected by suppurative processes. The arrangement of its principal fibres, the fibres that attach the tooth to its surrounding support, makes comparison between it and any other tissue well nigh impossible. They are very definitely grouped from gingival line to apex and to each group is assigned a well defined function. Knowing this it is easy to understand the effect upon the gingivae, for instance, when the free gingival group is severed, or the movements of teeth when the transeptal group has been broken by extraction or disease. When suppuration has for a protracted period affected this tissue these special fibres disappear and the remaining tissue in no way resembles normal peridental membrane.

Next let us consider the effect of pus upon the specialized cellular elements. It is a principle in biology that cells can live and thrive only in their native media. This principle implies that cementoblasts, osteoclasts and fibroblasts, must succumb to their changed environments. The deduction seems clear. To have an attachment to a root surface a new deposit of cementum is called for, and under these conditions there are no cementoblasts to make the deposit. Also, to functionate, the cells must needs lie in contact with a perfectly aseptic surface. The conditions seem to exclude all possibility of the thing hoped for.

The etiology of suppurative pericementitis, is our next consideration. Theory after theory has been advanced as to the cause or causes of this dread trouble and a review of the literature is a most bewildering exercise. The gouty diathesis theory, the special infection theory, the vague suggestion that the disease is due to some inherent weakness of this particular tissue, the theory that the disease is due to local conditions over against which is the proposition that the suppurative process is symptomatic of a general systemic condition, have all been projected and maintained while recently came this interesting deduction that it is due to a "destructive absorption of the alveolar process" which destruction is due to the poor blood supply of that process. The explanation for the alleged "poor blood supply" is that the process is a secondary growth. An outstanding item of interest marking almost all the treatises presented upon the subject is the almost complete negligence of the histology of the structures involved and their interdependence.

The most rational theory, it seems to me, is that suppurative pericementitis is due to local conditions, that it is the result of an initial but recurrent gingivitis. This brings the condition more nearly within our scope. Upon this proposition we are better able to follow its varying stages and what is more to the point, to more successfully contend with it. The causes of this initial irritation are perhaps easy enough to name. Malocclusion and serumal calculus deposits are nature's contribution, habits afford the sufferer's contribution and evil dentistry is our contribution—whether it is the result of our own indifference or the patient's interference. The suggestion is clear enough that the treatment of this oral scourge must be preventive—before it begins. In this respect every dentist may become a specialist—a specialist deserving the name. Not only must he be a specialist in operative procedures, preventing trouble by the perfection of his work, but he must be a teacher second to none in dental matters. "Mark Hopkins on one end of a log and a student on the other" no more constitute a college than a dentist and his patient. This implies that the student be youthful and the implication carries with it the suggestion that an educational propaganda is an imperative need. So long as specific causes and treatments are so much in dispute, and inasmuch as such calamitous consequences lurk in the train of this disease, an educational propaganda is as necessary as that employed to combat tuberculosis or typhus. The treatment of this disease by its prevention is a challenge to the profession to perfect its technique for every office performed in the mouth.

It has been noted that I have not dealt in definition, nor have I spoken of technique for the preventive procedure. I am aware that I have made no reference that any one present does not comprehend, and as to methods, I know there is no need of directions from me in such matters. The propaganda suggested may call for the orthodontist's services or extensive restorations and patients may refuse the attention. That is beyond our control and becomes an object to be removed by the quiet force of education. And even education may fail, but there our responsibility ceases. It is more to the point that I mention some items too little heeded in our wholesale practices. Too many of us give too small heed to the rudiments of our professional service. To remove the commonest causes of gingivitis we must recall what we were taught in the schools of tooth form and in our restorations regard as of infinite importance. occlusion and contact. If crown margins are to take the place of enamel removed from under the free gingivae, those margins must be non-irritating as our hands can make them. And as much so must be our filling margins. This, I take it, is not asking more than we have pledged—a conscientious service. May I mention one other phase of service? A patient presents for his first dental attention. That attention is improperly rendered and the teeth move to accommodate the work done. The next man who serves that mouth can never undo the effects of the first man's infidelity to the patient. Tremendous responsibility rests on the man who does the first dentistry in any mouth.

Someone is asking what to do with, and what results may be expected in cases already developed that present to us. Dentistry's greatest teacher suggested two remaining modes of treatment for such conditions—palliative and radical treatment.

The terms are self explanatory. It implies the removal of irritating agents, the cleansing of the pockets and the protection of the tissues. Following the dentist's operation the cleansing becomes the patient's task. Comfort may be secured and service as well, subject to diligent care when palliative treatment has been employed. What of reattachment? The answer has been implied in the presentation of the histology of these tissues. When the infecting agents have not had too long access to tooth surface and the cellular elements of the membrane have not been destroyed, an attachment is conceivable, but when pockets are formed two possibilities remain—a mere physiological attachment as in the case of implanted teeth, or the extension of the epithelium down the tissue wall of the cavity in the wake of the cleansed and reviving tissues, making attachment an impossibility.

And now I beg your tolerance for a summary of the suggestions made: the structure and manner of development of cementum; its dependence upon the peridental membrane for life and support; that it is a structure of continuous growth and that with the need of each successive movement a new layer of cementum must be deposited; that the alveolar process is dependent upon the peridental membrane for support and that it is removed when the fibres of the membrane are detached from it; that the peridental membrane is a highly specialized tissue and that such tissues do not rebuild themselves after suppurative degenerations; that specialized cells must lie in contact with aseptic surfaces to functionate; that the tissue remaining about a tooth after a long suppurative process is no longer similar to normal peridental membrance; and finally, that the suppurative pericementitis is preceded by a gingivitis which is easily recognizable and produced by some cause easily removed.

In closing let me make a quotation from a *Cosmos* of 1915: "When the dental profession realizes that pyorrhea is a preventable disease, that in its early stages, it is easily and permanently cured, that only those cases are hopeless that are long neglected; that no drug or vaccine ever will of itself cure the disease, and that dependence must be placed on local treatment, they will have taken the first step toward the elimination from the mouths of their patients, the chief of mouth infections."

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held January 2, 1917, with the President, Dr. F. E. Roach, in the Chair.

Dr. H. H. Schuhmann read a paper entitled "The Relationship of Oral Foci of Infection to Systemic Diseases."

DISCUSSION.

Dr. William H. G. Logan:

The essayist makes the statement that the findings of Rosenow and Billings are incorrect and their conclusion that the bacteria found in focal infections have never been proven to be the direct cause of secondary disease. Personally, I accept the findings of Rosenow and Billings and all other investigators who are of the same opinion in regard to the serious results of chronic focal infections as being indisputable by scientific investigation or clinical observation which outweigh their findings. Of course, I recognize that perfect analogy cannot be carried on in the animal as to the effects of focal chronic infections, for in the animal experiments we secure the bacteria from the infected area and change the virulency to some degree by propagating upon a changed culture medium and then introducing these bacteria with their increased virulence into the system of the animal at times with such a large dosage that the life of the animal is destroyed in a few days. This was the plan adopted in the early experiments along this line but in the present plan a smaller dosage is employed and the animal life not destroyed by bacterial effects is the rule. Yet, in spite of this variation of the rapidity with which these bacteria are carried into the system, we find the production of the original disease in a high percentage of cases. This has been made plain by Rosenow in his article "Electric Localization of Certain Bacteria."

Another inference to be drawn from the paper is that the rarefied areas about the root ends of teeth are not infected areas. This contention naturally causes me to ask what proof have we that it is not an infected area against the great array of evidence presented by authoritative men and recorded in medical and dental literature? These men have taken fluid from the root ends where rarefied areas existed and found that the predominating bacteria were streptococci. Until we have proof that bacteria are not there we must accept the proof we have at present.

Before leaving this phase of the subject, I desire to agree with the essayist that the problem of focal infections associated with root ends of teeth has not been solved by either the medical or dental profession and wish to further agree that the dentist must assume the responsibility of controlling infections associated with teeth for no other group of men are so favorably situated to combat this problem.

To those of you who give but little credulousness to the thought that a serious menace to the health is found in all chronic infections throughout the body, allow me to relate an interesting narrative. There came to my office today the last issue of the John B. Murphy Clinics. It was Dr. Murphy's request that an autopsy be made upon his body and the record publicly printed. In this latest issue covering a great many pages will be found Dr. Murphy's conversation with Dr. Keefe which occurred a few days before he died and he requested that Dr. Keefe take down certain notes. As a child he believed he had appendicitis and that the appendix would be found bound down, and that plaques would be found in the aorta. He had an infection of the kidney thirty-three years ago and thought that was probably the origin of his trouble. He could not help feeling that the seat of his trouble was deep in his abdomen in the region of the pancreas. He thought they would find his trouble due to metastasis from some point not causing any discomfort. The acute infection of his nose a few weeks before added to the metastasic infection, but that was not the chief source. He thought the chief source would be found in some area in which he had no discomfort.

In the correlation of necropsy findings recorded by Dr. W. A. Evans the statement was made that Dr. Murphy probably had an attack of appendicitis during childhood which resulted in practically the obliteration of the lumen of the appendix. In 1883 someone in Vienna diagnosed tuberculosis of the right kidney in Dr. Murphy, but he had never heard that tubercle bacilli were found. Histologic diagnosis of the right kidney—Chronic persistent infection probably due to some organism other than the tubercle bacillus. In Dr. Evans' opinion the infection of the right kidney which began in 1883 had persisted ever since and he did not think it was tuberculous.

In conclusion Dr. Evans states that Dr. Murphy's death was due to angina pectoris. He states that the probable seat of the old metastasis was the chronic thirty-year-old infection of the right kidney and had Dr. Murphy's right kidney been removed in 1883 or any time within twenty years thereafter, the arteritis would have been prevented.

Now in conclusion I do not feel justified with the present evidence presented by competent men in various sections of the land upon the seriousness of leaving chronic infections in the body, to inform patients that rarèfied areas are not infected areas neither do I feel justified in saying to an apparently healthy patient that a small focal infection will be harmless in their case and allow them to go without advising the eradication of that infection.

I am pleased to see that the essayist saw fit to take issue with Rosenow, Billings and other essayists, but Drs. Gilmer and Moody in all their works found the streptococcus present with slight variation in something beyond 90% of their cases, therefore, let someone call to our attention proof that these rarefied fields beyond root ends are sterile and when this proof is brought we will all say to that man, new bacteriological knowledge has been recorded and his name will be written high as a scientific investigator and as a valuable servant to mankind.

Dr. J. G. Reid:

I am interested in this paper. Today I picked up the Dental Review and in looking through its contents I distinctly recalled some of the things reiterated in this paper tonight that Dr. Schuhmann had presented before an Iowa Society, which makes this paper rather refreshing and in a measure corroborating what I had read. That was a very interesting paper, and I enjoyed reading it very much.

I want to report an interesting case that came to me indirectly. The patient is the son of a very dear friend of mine who became very much run down and afflicted about a year and a half ago. He had consulted some noted surgeons in Cincinnati and had been operated on for the removal of glands in the neck and axilla; in fact, he had been pretty well chopped up around both sides of the shoulder and neck. Following this operation he did not improve; he kept getting worse until he was sent home to die. He was hardly able to leave his bed for any length of time. He was seized with a very unpleasant pain in one of his molars, and was obliged to go to his dentist, who lived in a small country town, for relief. The dentist looked his mouth over and saw the condition of his patient and said to him, "I believe I have discovered the cause of your trouble." In the meantime, after these operations, his case was pronounced by two very prominent surgeons as Hodgkins disease, and considered incurable. But the story is interesting in the fact that the dentist said, "You have a very foul mouth, and you imbibe a considerable amount of pus from day to day from your third molars, especially the lower third molars." Pressure caused the issue of about a teaspoonful of pus from around two of these third molars at that time. He said, "I would recommend that you have these molars removed immediately." The patient said, "All right, I have been accustomed to being chopped up and think I can stand a little more." So the molars were removed, and in about two months from that time the young man began to improve. In the meantime, however, before this was done, he had been undergoing treatment with electrical applications and radium. As I have said, about two months after the removal of the molars he began to improve. This was about five months ago. This young man is a perfect athlete, is thirty years of age, powerful, strong, and healthy apparently. He is now on the road to rapid recovery. I am informed by his father who recently wrote me that they expect him to be well in two or three months more. He is able to attend to his business at this time. His case was evidently not one of Hodgkins disease.

I was particularly impressed with what Dr. Schuhmann said in reference to the diagnosis of infected areas about the root ends of teeth. I am afraid we are oftentimes misled by these conditions, and I think it behooves the profession to be careful in interpreting what may be found in a picture, because I think oftentimes mistakes are made in diagnosing these things incorrectly. I know I have made some mistakes myself, and yet I have been convinced by the picture that there was trouble.

There is no one more competent in my mind than the dental surgeon who is familiar with the history of his case and is able to diagnose the anatomical conditions from it. It is his life's work. I am not in a position to believe that these areas are the prima facie cause of the diseases that we hear about so frequently. I am rather skeptical in that belief, but that they are in a measure a great help to other conditions when those areas are cleared up. When we feel satisfied that there are diseased areas about the root ends of teeth and they are cleared up, I cannot see why we should be sacrificing teeth so frequently as we hear is being done from day to day.

I wish to thank Dr. Schuhmann for the opportunity of hearing his paper.

Dr. J. E. Hinkins:

I sympathize with and believe a good deal as the essayist does, and also as Dr. Logan has said, the work that has been done by Rosenow has to be accepted until something is done to combat it. At the same time, in my limited amount of knowledge, I cannot accept Rosenow's work as being analogous to the best work that might be done at the root ends of diseased teeth. I cannot see that there is any scientific comparison between the conditions. He speaks of producing a slow chronic infection and changes the condition and brings about an acute one, and that has been a sticker in my mind, and I would like to see and hope that the essayist has the material and work in hand which in the future will enable him to demonstrate a good many of the statements which he has made tonight.

I am also very much inclined to the opinion that even though we may get an X-ray shadow of this or that condition, how many of us can diagnose it or interpret it intelligently? I have had a number of teeth extracted on the recommendation of physicians and from X-ray findings, and yet with the most careful technic that we could use by having the sockets of the teeth curetted, there being no soreness, we did not find very much infection. But how are you going to prohibit it? Do you know of any method by which you can prohibit it? If you curet the sockets of the teeth, the foci of infection will get in there, how are you going to keep it from being contaminated? While the X-ray has been a great benefit to us, I see great harm from its use in many instances.

Professor Carlson is doing a considerable amount of interesting work in connection with the control of hunger in health and disease. I have read the physiological works carefully of Whitney, Wheeler, Cameron and others of the United States Agricultural Department; I have been intimately at work with Hopkins and Whiting of the University of Illinois, and Dr. Cassell of the Marine Hospital Service; and I am also familiar with the work of Acree of Wisconsin, and I believe we will live long enough to see the time when, by having a proper diet, the microbes will not be considered such awful bugbears after all. When you see the work those men are doing and read the reports of the pure Pure Food Bureau and see what mineral substances are taken out of our flour, instead of having the percentage of phosphates and carbonates there, they are eliminated, and what do we have? We have the sugars and starches which are susceptible to decomposition. When we go back to nature and see the physiological action of the nitrifying bacteria, they having the power to be taken up by the plants that produce the nitrites, that produce the tri-calcium sulphate in the soil; when we are getting our cereals prepared for us, the very foundation is taken from that food.

There is a great work going on today. When we study the work of Professor Carlson on the control of hunger in health and disease and see the physiological action he gets there and the conditions that are produced and make comparisons with what we get from food-stuffs, and enzymes, and then go up to the Marine Hospital and other places and see the other work that is going on, it is very, very interesting. The question is being raised today among some of the universities that the nitrifying bacteria from the atmosphere have the power to combine with and reproduce the ammoniacal salts with the manures and fertilizers that take it up and form nitrous acid, and then the nitrites, and go into the bowels of the earth and break up the phosphates and carbonates, so that they can go back into the system. When we breathe into our lungs one part of oxygen and four parts of nitrogen, we eliminate the oxygen every time we exhale a breath of carbon dioxid. The carbon goes into the plant and is left there. Sunshine liberates the oxygen, it goes back again, and what becomes of the four per cent nitrogen that goes into the lungs of the human being? What is it sent there for? If the nitrogen, which is supposed to go into the bowels of the earth, breaks up this phosphate to produce the life sustaining principles of the body, why do we breathe four parts of nitrogen into the system and one part of oxygen? Those are interesting questions for solution.

This work is not ready for publication, but the best physiologists in the United States today are working at these things day and night, and it is to be hoped that they will accomplish great good. I believe that I will live long enough to see the day when food, fresh air and sunshine will eliminate many of the microorganisms we have to contend with today. (Applause.)

Dr. Sydney J. Knowles:

The paper Dr. Schuhmann has presented to us tonight has appealed to me in this way: that we are not certain of our ground—at least, I am not. I am impressed with this point, that the teeth of the human being have as great a function as any of the organs in the body, and the question of infection attacking these teeth is of course a serious one. When we are led to believe that we can only eliminate infeetions by the radical treatment of extraction, we are treading on rather delicate ground. We are taking away something that is very much needed. We are in the position at times where we are not sure, and that is where Dr. Schumann's paper fits in. It will serve as a check on us in jumping at conclusions. That is the way it has appealed to me.

Dr. Logan has expressed himself very decidedly and I regard what he has said very highly, as his opinions are of great value. We are all familiar with the fact that we have had cases whereby eliminating the conditions around the roots of teeth by extraction and curettement we have been able to overcome some secondary conditions. At times it is necessary, as the essayist has said, to make use of autogenous vaccines. On the other hand I have in mind a case of a man whom you all know, who suffered from neuritis. With the assistance of an able surgeon he had taken every possible factor into consideration. His tonsils and appendix were removed, and everything eliminated that was thought possible as being a factor in the cause of his neuritis from which he had suffered for some three years. His teeth were examined, X-rayed and the five that showed trouble around the roots were extracted. He continued to suffer with neuritis.

So this is a case that puts us in a position where we are uncertain. It is a serious thing to remove teeth from a human being, and it is equally serious to have diseased teeth that may endanger life.

When a group of men get together one of the first things they will discuss is the subject we are talking about now. The different meetings I have attended recently have been along that line, and the whole dental profession is much interested. Still we stand at present where we cannot positively state just what is the cause of a particular trouble. We may have conclusions both ways.

Referring to Dr. Rosenow's work, it is stated by the essayist that it is not fair to take a suspension of bacteria and inject it into an animal and have that mean anything.

I have been told that the injection of an equal quantity of a suspension streptococcus viridans into two rabbits of the same size and age has resulted in the killing of one animal, while the other grew fat. This shows that there is a force that has the power of imparting to that animal something that we do not know a great deal about today, the power of resistance. The experiment I refer to is a definite one made by Dr. Moody.

The paper brings out the point regarding preventive work, which I am very much interested in. The cause of some of these rarefied areas has been said to be the result of the use of arsenic or certain irritating drugs which we all agree are hard to control. These drugs may have so lowered the resistance of the tissues that micro organisms may attack them. I believe all the agitation regarding foci of infection has made us feel we should be more conscientious and more careful about our work, especially in connection with root canals. It has seemed to me that the use of more bland drugs in root canals will reduce the possibility of these rarefied areas by not reducing the tissue tone at the end of the root.

Dr. L. L. Davis:

We have listened to an essay this evening that I think has been wanted for some time. I think some of the leading lights of the dental profession and medical profession have run wild over this subject of oral foci of infection producing systemic diseases.

The statement has been made by Dr. Logan that in a series of over one hundred consecutive cases the blood findings were normal in over sixty per cent; that only 40 per cent of the cases showed any blood disturbance, but that in 90 per cent of the cases of blind abscess he had definite blood results different from the normal. We cannot go back to the records simply because there have been no records from the other side. There has been no attempt made to get the records on the other side of the question.

I think the paper is timely in that it will stir up those who have raised the question in their minds as to the possibility or practicability of sacrificing every pulpless tooth because that is the only thing according to all accounts that will cure the trouble. If you have got a bad tooth it must be removed or else you will have trouble. The only thing for us to do is to collaborate and get reports of cases that will show the other side of the question. Certain ones have been making investigations along certain lines and their cases have been selected simply because of systemic trouble. How many people are there that do not have systemic trouble, yet they have these rarefied areas at the ends of roots. Simply because they have found certain things under certain conditions is no proof that in all cases these rarefied areas must be deleterious to the person. That is my idea of the whole subject, and I think the paper is timely, and it is a question for serious consideration and for intensive and exhaustive work along these lines. We have certainly got to have it unless we resort to the old method of extracting teeth and putting in plates, because that seems to be, according to the latest ideas of the greatest investigators along these lines, the only thing to do, to sacrifice teeth that show the slightest disturbance, or else we are going to kill the patient, and that does not appeal to me as a conservative practitioner.

As to the case that has been reported tonight, I know that gentleman to be a capable, earnest worker in the dental profession, and teeth in his mouth were sacrificed, contrary to his own ideas, simply because the medical man could find no foci of infection as a cause for his neuritis. Notwithstanding his teeth were removed, he still had his neuritis.

I know of two other cases where the people had no teeth in their mouths whatever, and yet they have rheumatic trouble; they have arthritis and other pathological conditions that cannot be accounted for. Evidently oral foci of infection have been eliminated in these two cases.

We cannot go back to statistics already collected and that have been reported. So it is up to us to do further work along these lines and get statistics which will controvert the other cases that have been reported. For that reason the paper is timely and of great value. It is the right moment for calling a halt on this extreme method of procedure. I have not the slightest objection to the amputation of a tooth root where there is pyorrhea or alveolitis, or whatever term you may wish to use. The trouble has caused recession and finally loss of attachment entirely, or a very small portion of attachment, of that part of the root end, which is amputating one of three roots where the other two stand in a good healthy condition. The idea of resecting every root that shows a rarefied area over the end of it, according to the radiograph is ridiculous. I do not think it is necessary. I do think, however, that where you get a picture that shows imperfectly filled root canals, and you can trace beyond the line of that root canal so as to be able to remove that root filling, clean it out, and fill it to the end, you can get results under conditions of that kind. But I have seen quite a few pictures where the roots were not filled to the end, but there was nothing to indicate there was any root canal whatever beyond the line of the root filling. In those teeth the roots looked well. There were no rarefied areas. It is unnecessary to fill entirely to the apex of the root.

Dr. F. E. Roach:

I appreciate the presentation of this subject in the manner in which Dr. Schuhmann has presented it. I feel that the subject of focal infection has been carried a little too far, and this paper possibly will make some of us a little more cautious about extracting or sacrificing teeth without very careful consideration.

Dr. Truman W. Brophy:

There is a certain phase of this subject which has not been mentioned this evening that I want to call attention to for the purpose of putting those of you who are engaged in research work in line to thinking of this particular condition and after you have worked on the subject to either disprove or confirm my statements.

I do not believe that a darkened area, as shown by the X-ray picture, about the apex of a tooth root is positive evidence of disease. I do not believe anybody can prove it is true in all cases. In many cases it is. What is that darkened area? In some cases it is simply an absence of bone. In other instances it is a space in bone filled with granulations; in other cases it is a space in bone that is not filled with anything. It is an empty space. There has evidently been a disturbance of the bone, either an absorption by pressure possibly by an escharotic, possibly by pus, at any rate, it is a disturbance of the bone. This is a fact I want to put to those who are working in the laboratories. I believe some of you have been faithfully working three or four years in laboratories in the interest of truth. I know that Dr. Schuhmann, Dr. Davis and others have been staying downtown at nights for the last two years working in laboratories conducted by some of the very best scientific men in this city, learning all they can about bacteriology, and so forth. There is very little known of bacteriology when we come down to facts compared with what is to be learned. What is that we see at the end of a tooth and what is to be done? Amputation of the root end has been mentioned. I amputated root ends of teeth twenty-five years ago, and those teeth are doing good service yet. Supposing we should find that darkened area anywhere else in a bone, as in the tibia, what would you do for it? Would you cut off a man's leg because he had osteomyelitis? Would you amputate a man's arm because he had osteomyelitis in the radius or ulna, or how would you cure it Think of that. Go back to the laboratory, take specimens from somewhere else in the bones besides those minute cavities around the ends of tooth roots and examine them. You may find an area in a long bone filled with pyogenic microörganisms. What are you going to do with it?

I said to Dr. Emil Beck, while on a visit to his hospital, I want to see some of your slides which show osteomyelitis of some of the long bones. He replied, "All right; I have hundreds of them here." He brought out many slides, and picked out one of a case of osteomyelitis of the radius. He showed me the X-ray picture. He showed the necrotic area of bone, then he showed me a picture of the same case which he had treated with bismuth paste, and still later another one showing the patient cured. He said, "Here is another one with a darkened area just as you see around the end of a tooth root. It may have gotten pyogenic microörganisms in a different way, not through the canal of a tooth, but in some other way. Nevertheless the organisms are there. What is this? This is a disease of the bone the same as you have around a tooth root. What do you do with it? In this case I open down upon the bone, I curet out the diseased tissue, and the patient gets well. Whoever said anything about that in connection with teeth in comparing it to necrotic or carious areas of bone anywhere else?

There is another feature in connection with these changes. Who said anything tonight about tuberculosis or about syphilis or about rickets or about any other of the diseases that may lead up to diseases of the bone, where a little irritation anywhere either of a tooth root or in the femur or anywhere else might lead up to destruction of the bone tissue.

Let us take the broadest kind of a view of this subject. Let the men here tonight who are working in laboratories work out and bring to us the truth.

How much work Dr. Rosenow has done with reference to tuberculosis and the various other maladies that lead up to diseases of the bone in connection with irritations about the ends of tooth roots, I do not know. I have the highest regard for Dr. Rosenow and his work, but he, like all other men, educated in the way he has been, quite likely has not studied deeply the subject of dental pathology. His errors would be the same as the errors you would make if you undertook to solve some problem pertaining to the kidney or liver or some other organ. We do not devote the amount of time to any particular study as he has done. This problem must be settled by dentists, by men who have been educated in the field of dental pathology, by men who have given thought to the problem of dental diseases, who know dental histology, and have carried on their work in the broadest kind of way to acquire a general knowledge of it. Those are the men to settle the question. The men who enter upon this subject with determination are the men who will solve this problem of infections of oral origin.

Dr. Logan said that no one had demonstrated that a darkened area about the apex of a tooth root was not free from pathogenic microorganisms. Did you say that?

Dr. Logan:

That had not been proven to be sterile.

Dr. Brophy:

I know of a case where that proof was established. Some years ago—I do not remember how long, but it must have been twenty or more years—a certain family living in the city were patients of mine, and later when I stopped filling teeth they went elsewhere. A woman, now about 35 years of age, who was a girl at the time when I first knew her, came to see me within the last year and stated that she was in great despair and wanted my advice. I said to her, "What is the matter?" She replied, "I have been advised to have my upper teeth taken out." I asked her for what purpose, and she replied, "Because I have neuritis and my physician says it is caused directly by these teeth; that there is no other recourse, and I must have my teeth extracted. It is imperative." I said, "Are you going to have it done?" She replied, "I do not know." I looked at her teeth and found that her incisors were all good; they were not pulpless; the pulps were alive. The cuspids were normal. She had filled roots I think in bicuspids on the right side and one molar. The second molar had a dead pulp in it. I had skiagraphs made and found that the tooth roots were well filled. There was a little darkened area about one, but it was not sensitive to pressure. There was no indication of trouble. Then I found a root on the opposite side which had a darkened area about it and I told her she had better have that out, and not any other. She had that taken out, and still the pain continued. After another skiagraph was made, taking in the two bicuspid teeth on the right side above and two molars, I observed something that I did not notice the first time. I had the plate at a meeting of this society one night and handed it to the members and they did not see what I found until it was pointed out. In the second molar there was a pulp mass of secondary dentine, a pulp nodule in the chamber. The tooth root above referred to was taken out under the most careful precautions, the surface all around it was sterilized, the tooth root was placed in sterile gauze. Some of the contents at the end were removed with a fine spoon, and this was placed in three sterile tubes; these tubes were sent to three different laboratories, no one laboratory knowing that a tube had been sent to other laboratories. They were examined and pronounced by each one of these pathologists to be sterile. The cause of the trouble in that girl's case was a pulp nodule, and when the chamber of the tooth was opened by the dentist and the pulp destroyed and the pulp nodule removed, that was the end of her pain or neuritis. She has not had any pain since.

Now then, supposing that girl had taken the advice of the physician and had her upper teeth removed, together with the others, that physician would have said, "Didn't I tell you so?" You are now free from pain; your teeth were the cause of the pain, and the girl assuming he was right would not have known any better.

In this case the nerve irritation set up by the pulp nodule is proven by the fact that the nodule was taken out and that ended her trouble.

The problems we have taken up tonight and considered will have to be solved as I have previously remarked by dentists; I do not see how medical men can solve them. It is really outside of their domain unless they study pathology from a dental point of view more than they have done in the past.

Dr. Schuhmann (closing):

As to the question of pictures of blind abscesses, I only want to state again that they are not easily diagnosed from X-ray pictures without considerable study. I mentioned in my paper that darkened areas about the root ends frequently meant no pathological disturbance whatever, and may be due to coagulated lymph brought about by the coagulating influences of drugs used in the treatment of root canals. Then again, many of you have seen pictures of conditions which denoted that a real blind abscess, or at least, such a picture of a condition which we comprehend as a blind abscess, had at one time existed, and that the blind abscess is partially again filled with the deposition of new bone, showing that a regenerative process has taken place in the abscess sac without any therapeutic measures having been instituted by the dentist to produce such a change. If you will think that over, that fact will give you a good deal of food for consideration, it would take too long to go into the consideration of this matter at this time.

I was very much pleased with the discussion of Dr. Logan, who brought out many points that are of great interest. I agree with him in some instances, while in others I disagree. I do not doubt in most cases where teeth have been removed with abscesses attached to the roots of the teeth, the pockets of these abscesses when opened will clearly show that the contents are not sterile; but I also do not doubt that all of you have never seen any mouth withor without abscesses that was sterile. Microorganisms are everywhere in healthy mouths and diseased mouths; they are in blind abscesses, probably always. It is a question of virulency. Sometimes they are present, and sometimes they may not be, so the mere fact that blind abscesses are found not to be sterile is of very little importance.

As to the blood count in these conditions, where the *constitutional* disturbances were not sufficiently severe to produce a leukocytosis or a aligothythemia, I have found in *my* blood counts very, very slight variance from the figures which are commonly accepted as absolutely normal. In a blood count, unless the white count runs up to at least 10,000, it amounts to very little diagnostically. An increase in the white blood count from normal of 5,000 to 6,000 or 7,000 means nothing whatever. If you take a blood count of a patient and find it is 5,000, and ask that patient to run down three flights of stairs, come back, and then take another blood count, it will be higher, possibly 7,000. A variance of that kind amounts to nothing. If a blood count is taken before such abscesses or pyorrheal pockets have been handled by dentists, and should show constantly a slight increase in white blood cells, say 7,000 or 8,000, and later on, after the treatment has been carried along, shows a figure approaching normal or nearly normal, that to my mind might show a low grade of infection had been removed.

The reasons which led me to believe that oral foci of infection are more likely to be responsible for a general low grade infection and for general depression (immunologically) than they are responsible as a direct cause for systemic diseases are these: in the first place, we are dealing with organisms of a very low degree of virulency. If we were not, the clinical symptoms would be vastly different from those which we find in blind abscesses or in alveolitis which abscesses we know are sometimes present for over fifteen or twenty years without giving rise to symptomatology of any kind. So the degree of virulence of these organisms is most likely very low. There are other reasons why we believe them to be low. For instance: In studying immunology there are various theories which account for our becoming immune to organisms: the chemical theory, the starvation theory, the noxious products theory and many others. In fact, the other theories are the most important, but in *this* connection I mention *these* for the reason that we have here a small sac containing purulent material. Here are organisms which are propagated in a small area without access to oxygen, are constantly throwing off their own waste products into a small amount of material from which they derive their nutrition. Is it not natural that organisms in a sac of that kind and under such conditions would either fall prey to the immunization laws and die or at least become very much depreciated in their degree of virulency?

Dr. Gilmer states that in blind abscesses he has found that the prevailing organism is the streptococcus viridans. I am engaged now in some research work on blind abscess but at the present time am quite ready to accept Dr. Gilmer's findings with reference to the prevailing organism in blind abscess but not without a word of caution. It is not easy to differentiate all streptococcus groups of organisms and not easy at all times to positively identify the streptococcus of the viridens variety. You all know how closely allied this organism is to the streptococcus hemoliticus and Rosenau has shown us how easily one is changed to the other. Both of these organisms are at times found in the blood stream and are then deposited at various sites of lowered resistance. It has been claimed that these pictures we denote as blind abscesses are frequently merely the result of such deposition of organisms and are in themselves a secondary infection. I do not know if that theory has been substantiated or not but it surely is a possibility and if true we could hardly classify these abscesses as primary foci of infection. Another thought comes to my mind: Blind abscesses which have lain dormant for twenty years have very gradually and slowly thrown out organisms of a very low degree of virulency into the blood stream, they to my mind should act almost as vaccines and would stimulate antibody production against the microbes which are in the abscesses.

Another reason why I believe these organisms are more apt to produce a low grade of infection rather than a positive disease is the result of my studies of vaccine therapy, some of the phases of which I spoke of in the paper. Organisms obtained from oral seats of infection do not act as positive vaccines against specific diseases and they certainly should if such organisms were the primary cause.

Statistics are of very little value. They usually lean towards the idea of the man who is carrying out experimental work.

I have treated a great many cases where I thought infection located elsewhere in the body was caused by oral infections, by vaccines. I do not recall a single case of endocarditis, arthritis, cholecystitis, or appendicitis that was cleared up by the use of vaccines alone. These vaccines do considerable good in that they remove symptoms which we would expect to find in cases of low grade infection. They remove malaise, headache, insomnia and nervous disturbances. In some cases they remove mild skin affections which as you know frequently are due to nothing more than a lowered degree of vitality. Patients are put by the vaccines into an improved condition so that the antibodies of the individual can then play an active part in the cure of the disease, or so that physicians can use therapeutic measures to better advantage. They remove the low grade infections, and put the patient in a more risistive condition. None of these secondary infections have ever been proven up by any of the laws of Koch. There is no question in my mind of the fact that oral foci of infection may be injurious in a mild way, but I do not believe they harbor organisms sufficiently virulent to cause any *distinctive systemic* disease. I do not believe blind abscesses can contain such virulent hemolytic streptococci or streptococcus viridans which will get out into the blood stream and locate on the heart valves to produce endocarditis without other factors being present.

Dr. Reid has cited an interesting case, but it must not be forgotten that there are a good many of these interesting cases.

For instance, the one cited by Dr. Brophy was very interesting. The symptomatology may lead a physician or dentist to suspect oral foci of infection are at the bottom of the case, and that by the removal of these foci of infection the case will clear up.

Dr. Reid:

In the case I cited, a diagnosis had been made by two eminent surgeons of Hodgkins disease. They had simply overlooked the local conditions that were found by a country dentist.

Dr. Schuhmann:

The case of Dr. ——— comes to my mind; the doctor suffered for a long time with neuritis and he had four or five teeth removed on advice of his physicians without any beneficial results whatever. He went back to his learned physician who told him there was only one other thing left that might be the cause of the trouble, and that was his appendix, which should be immediately removed, and the doctor informed the physician that his appendix had been taken out 18 years previously. The physician then said that the only other condition he might have was an abscess of the kidney, and recommended operation. The doctor replied, "No one is going to tamper with my kidney."

As to the amputation of roots, while it has very little to do with the paper, I want to say that during a practice extending over 26 years I have never amputated the root of a tooth. I have opened up roots and removed fillings and refilled the roots and teeth, and had X-ray pictures taken and found no sign of trouble.

CHICAGO DENTAL SOCIETY.

A regular meeting was held Tuesday evening, November 21, 1916, with the President, Dr. George C. Poundstone, in the Chair.

Dr. E. D. Coolidge read a paper entitled "Root Canal Treatment and Filling," which was illustrated by numerous stereopticon slides.

DISCUSSION.

Dr. C. N. Johnson:

Mr. President, Ladies and Gentlemen: It is quite unnecessary for me to say anything before this audience in commendation of the essayist of the evening, either as an operator, an investigator, or a writer. The paper of the evening, so far as that is concerned, speaks for itself. I simply want to say in this connection, that if the profession generally had followed the technic, or even a technic similar to the one that has been outlined tonight, there would never have developed in the minds of the profession of dentistry or medicine a doubt as to the efficacy of root canal work such as exists today. I cannot add anything to the technic of the operation as outlined by Dr. Coolidge, but probably the thing in the minds of most of the profession today is this: In view of the statements that have been made as to the possible ill effects of pulpless teeth, there may be, there probably is, in the minds of the profession some uncertainty as to the efficacy of root canal work and some doubt as to the possibility that this work may be safe to the patient. I believe that in some quarters with this, as with other subjects, men have gone to extremes. I believe that in following these extremes many teeth have been extracted that should have been left in, and would have been of very much more benefit to the patient than injury. That must be expected in all these reforms because this movement must be looked upon in the light of a reform. We can no longer go on in the profession managing pulpless teeth in the manner they have been in the past. We must improve our technic, else we lay ourselves open to serious criticism, yet I want to make the statement tonight, if all the things were true that have been said as to the evils done by pulpless teeth, very many of our patients who are living and well today would have been dead long ago. (Applause.) We must not be carried off our feet entirely by mere assertion. We must keep our faces turned toward the light, be willing to take the light in, when it comes to us, and be thoroughly conscientious in our attitude toward the subject. If we do that, we shall no longer blink at infectious areas at the apex of any root of any tooth. But one evil has resulted from this; it has been referred to before, but I am going to emphasize it tonight, and if I tread on the corns of some of my good friends I will not apologize for it. The general rule in connection with this subject of pulpless teeth has been this in certain localities at least, that if a patient has been ill from almost any kind of illness, and that patient goes to a medical man (this, you know, is the medical era of teeth), the first thing that the medical man does is to send the patient to an X-ray man Now, we need the X-ray and the X-ray man, but very many of these X-ray men know nothing about pathology, and some of them know nothing about medicine at all, and more of them know nothing whatever about dentistry. But in the face of that the X-ray man has been making a diagnosis, and worse than that, he has been reading diagnoses to the patients, and he has no right to do either the one or the other. (Applause.) We invite his aid, those of us who have not an X-ray machine. We invite the aid and co-operation of the X-ray man, and we are under deep obligation to him, but his duty is limited to making a picture and consulting us about it. We will be glad to invite him to help us in making the diagnosis, but he has no right to tell that patient anything at all. Too frequently he has done this; he has made a picture of teeth or a tooth, and probably he never saw a tooth before he began to make X-rays. He never heard anything about the anatomy or histology of the teeth or pathology of the teeth, but he will write "abscess," "infection," "pus pockets" on slips accompanying these X-rays, and hand them to the patients. And if he can not find infection or abscess, he has always written "pyorrhea." Any of these terms are formidable to the patient, God knows, and frequently a patient goes back to the physician, and the physician takes the diagnosis of the X-ray man, and orders the tooth or teeth extracted, and the way to the extraction specialist is a short one. I congratulate the specialist in exodontia.

There is one individual in this whole situation who has been overlooked, and that is the family dentist. Too frequently he is forgotten in the shuffle unless perchance the patient happens to think it might be a good thing to consult him, and even then the patient stepping into the office of the family dentist with the X-ray in his hand and legend across it "abscess," comes in with the preconceived conviction that he is suffering from a serious infection. I am going to make the statement that no X-ray man knows whether there is infection at the end of the root of a tooth that has a shadow or not. I have asked X-ray men whether a shadow at the apex of the root of a tooth meant an active abscess, a chronic abscess, or an area that might have been there twenty years ago and in which there is no infection today whatever, and they acknowledged they could not tell. What we want is a little honesty, a little charity, a little breadth of view in this matter. If we have that, our patients will get better treatment without being frightened to death on the way there. Patients have been stampeded to the extraction of teeth when they should never have been removed at all. There is a lesson in all this to the X-ray man, the dentist and physician. It means we must co-operate, that we must consult one with each other, that we must not blind our eyes to the light when it comes to us, but we must be sure of our ground and not do more damage in working a reform than we are doing good. We have no right to leave in any mouth any infected area demonstrated to be infected. I also claim that before we condemn teeth for extraction, we must be sure that there is infection there. Let us look at this subject in a broad way, and let us think not only of the excitement of the present moment on this question, but let us remember the years and years—I was going to say centuries past—in which men of honor in our profession filled pulp canals and have kept patients alive, whereas as I said a moment ago that if all these things were true, half of our patients would have been dead long ago. This does not in any way minimize the utmost care and the utmost attention that we should give to all of these infected areas. The thing that pleases me most in the whole situation is this, that on account of this agitation, although some men have gone to extremes, we will have a better technic for the management of these pulpless cases.

I will conclude by saying that if the members of this society, who have listened to this splendid paper, will only take it to heart and follow out the technic Dr. Coolidge has given you, if not exactly in every detail, in some other detail, as painstaking as he has outlined it—if you will do that, your patients will be better served in the future than they have been in the past. (Applause.)

DR. JOHN P. BUCKLEY:

Mr. Chairman, Ladies and Gentlemen: I have had occasion to review in the last few weeks all of the papers that have been written on focal infection and its relation to systemic disease, and the treatment and preparation of the canals of pulpless teeth including the filling of the same, and I can pay no higher compliment to our essayist tonight than to say that of all papers I have reviewed, this one stands second to none. We are proud of Dr. Coolidge, and we are proud of the work he is doing.

My discussion of the paper will be confined to the filling of the canals after they are properly prepared, and I will show you pictures of a few practical cases in my practice.

The operation of filling root canals stands as a sort of dividing line between the subjects of therapeutics and operative dentistry proper. There has been a great variance of opinion regarding the methods and materials used for this purpose. The method employed in this operation depends largely upon the material the individual operator uses, and a great variety of materials have been suggested and used. In the light of our knowledge today of focal infection, it would be fortunate indeed if it could be correctly stated that all of the materials used for filling root canals in the past, except gutta percha, have been discarded. All, with that one exception, have been tried and found wanting. The radiograph is proof of the correctness of this statement. In my opinion, which is also shared by men like Black, Rhein, Callahan, and others, gutta percha, modified and used in some manner as to best meet the needs of the individual operator, is the only material at our command upon which reliance may be placed. From experiments made, Price is even skeptical regarding gutta percha on account of its inherent tendency to shrink, but as against laboratory experiments the records of thousands of clinical cases prove conclusively that this material, properly used, answers our every purpose for filling the canals of pulpless teeth. This being true, the proposition resolves itself into the problem of determining the best method of modifying and using the material. We may modify the properties of gutta percha by incorporating within its substance certain drugs, and drugs are added to root filling materials for two purposes; one a pharmacomechanical reason, the other on a therapeutic basis. In the case of gutta percha it is admissible to add to and use in connection with the material such drugs as chloroform and eucalyptol for pharmacal and mechanical purposes. In the opinion of Callahan, even rosin may be added on this basis. Chloroform and eucalyptol will soften the material which permits its adaptation, by proper manipulation and with heat and instruments, to every irregularity in the canal which has been cleaned and opened by previous treatment. Thus the latter is completely filled with non-absorbable and, if properly manipulated, I believe, non-shrinkable material. Whether or not we are justified in adding drugs to root filling materials today for therapeutic purposes is a debatable question.

Speaking of the use of the many so-called "permanently antiseptic" root-filling materials, of various kinds, which have been advocated and used, Best says: "The only possible excuse, I can see for the use of these preparations in the roots of teeth is that the operator knows he has left something in the root which he should not have left and, instead of removing it, he places his 'life saver' on top of it and rests assured he will have no further trouble from it in the future." When we remember that to which I and others have repeatedly directed attention, namely, that there is no such thing as a permanently antiseptic root-filling material, you can not rightfully have this satisfying assurance. That gutta percha, aseptically introduced into an aseptic canal, will remain aseptic for years, is the firm belief of myself and others based upon years of clinical experience and observation. We have no right to fill the canal of a tooth which requires an antiseptic as such in the filling material.

Referring again to Best, he makes the statement that the only solution lies in the almost entire non-dependence upon antiseptics in canal filling and in the maintaining of asepsis in the operation. I fully agree with the first part of the statement that we do not need to depend upon antiseptics as such in our root-filling material, but I firmly believe in the liberal and generous use of antiseptics and in the careful and intelligent use of disinfectants in establishing and maintaining asepsis in the treatment of pulpless teeth and the preparation of the canals for filling.

In filling root canals it is the safest practice to always adjust the rubber dam, for *asepsis must be established and maintained;* the canals should be aseptic before the operation is attempted. If there is any doubt in this regard, the operation should be deferred until they are in such condition. Not only should the canals be sterile, but all instruments and utensils, as well as the operator's hands should be germ free. The methods of accomplishing this end have been considered by the essayist. Instruments may be sterilized by moist heat which is a penetrating disinfectant. The cotton and other such material may be sterilized by dry heat; Dr. Coolidge included gutta percha points here. I do not believe he meant to say he could sterilize gutta percha points by dry heat. In order to sterilize by dry heat, it is necessary to heat the material from 160° C. to 170° C. for two hours or, at least, to 130° or 140° C. continuously, and if you heat gutta percha that high, you will spoil the gutta percha points. While the instruments may be sterilized by moist heat, and cotton and other material by dry heat, it is necessary to use chemic agents for sterilizing the hands and the gutta percha points.

Since the technic of my method of filling root canals differs somewhat from that described by Dr. Coolidge I will give it to you.

In filling large canals, especially those in connection with which dental granulomas, or alveolar abscesses, have been treated, where the apex is large, we ought not to expect to get response from the patients on account of the loss of tissue in the periapical area. It is best here to measure, with cotton on a broach, the approximate size of the canal and then use one cone which approximately fits the canal rather than use two or three smaller ones, with the possibility of unnecessarily forcing one through the apex and into the periapical area. With the approximate size of the canal in mind, the latter is moistened with chloroform and this followed with eucapercha. Then the proper sized cone, flattened on the large end, should be dipped in chloroform and placed in the canal, with the pliers. When the point is thus introduced, it should be worked up and down a few times with a slight pumping motion. In this manner the chloroform and the eucalyptol soften the outer surface of the cone, leaving the central portion with sufficient resistance to cause the gutta percha to spread laterally. The cone is then pressed to place and root canal pluggers may be used and the mass of gutta percha packed in the canal. If chloroform is used, very little heat is required to soften the cone. Finally, the packing may be done with a tampon of cotton or Japanese bibulous paper, saturated with chloroform as suggested by Rhein.

In filling large canals from which live pulps have been removed, the patient will usually flinch when the cone is first introduced. When this occurs, we should wait a few seconds, when the cone may be gently pressed much farther without causing the patient to flinch a second time. If these precautions are observed, they will be the means of guarding against much of the pericementitis which frequently follows. In filling all root canals we should make every endeavor to have the sterile root filling reach the end of the root. Dr. Rhein has proposed encapsulating the apical end of the root with fluid gutta percha in all cases where the canals have been treated which involve the periapical tissues. I believe the future will prove this to be necessary in all cases where the infection have involved the periapical tissues.

Referring to the method which Dr. Coolidge mentioned in filling root canals, as advocated by Dr. Callahan, I have this to say: I see no advantage in the addition of rosin in the chloroform. Callahan adds rosin to chloroform, making a thin solution which he introduces into the canal, and with which he makes chloropercha in the canal by pumping the gutta percha point up and down until the outer surface is well dissolved. This chloropercha has the rosin incorporated in it, and Callahan believes he can fill the mouths of the tubali and all multiple foramina with this resinous gutta percha. He can do so if the tubali and foramina are open and free from moisture. Callahan shows beautiful specimens of dissected teeth where the canals have thus been filled *out of the mouth.* In the mouth where it is difficult to keep the apical end of the canal absolutely dry, even if we were justified in desiccating the tooth-structure to this extent, which is questionable, I do not believe such beautiful specimens could be shown. Then, too, if we are justified in following Rhein, as I am strongly beginning to believe we are where the periapical tissues have been involved in the infection, it is best to encapsulate the end with plain gutta percha rather than have a substance like rosin incorporated with it.

DR. ARTHUR D. BLACK:

With all due respect to the two previous discussors and also to myself, I am not so sure but what we would have been better off if we had gone home when Dr. Coolidge finished reading his paper, because after Dr. Johnson had finished his discussion, I am sure we were somewhat confused over what we ought to do, and after Dr. Buckley finished his remarks we were more confused, and after I get through you will probably be still more confused. This only represents, however, differences of opinion that exist in the minds of men who are practicing dentistry today. Differences of opinion have been expressed here tonight which cannot possibly be harmonized. Somebody is wrong, and we do not know who. That is the worst of it.

I want to pay my tribute to the splendid paper which has been presented by Dr. Coolidge; even more to the work behind the paper than to the paper itself. This is the type of paper which brings to us the results of careful operating and of careful notation of those things which are absolutely necessary to bring us out of the confusion in which we find ourselves. A large number of men must study their cases carefully and keep accurate records. until we will be able to say positively that certain things will bring about certain results.

There are two or three phases of the subject to which I wish to refer. First, the matter of asepsis. There is no question but what infection introduced by dentists into pulp chambers and root canals causes a percentage of alveolar abscesses. What percentage we do not know. But here is one place of attack in which we may tremendously improve our technic by simple means. I think from what Drs. Coolidge and Buckley have said tonight, some may have the idea that it would be a difficult thing to treat a root canal aseptically. It is not so. It is not as complicated a proposition as one might think. In the first place, I think some of the things which have been suggested in that connection are impractical. I think it is impractical for a dentist to do these operations with sterile hands. It is impractical under the conditions which we must face today in operating. It is not practical for a dentist to have his hands sterile and keep them so during pulp canal treatment, nor is it as essential as in the case of a surgeon. The idea is impractical because for it to be practical the dentist must have surroundings and equipment of a surgical operating room. Of course, it is not impossible, but it is impractical today. I think it better to have an aseptic technic for pulp canal treatment which does not require that our hands be absolutely sterile. This can be simply done. We must first have the rubber dam, because we must have the field of operation sterile or else there is no need to have anything sterile. Mention was made by Dr. Coolidge that after the rubber dam is in place, the teeth included should be rendered aseptic by the use of some antiseptic solution. For the instruments that are to go into the canal, except those which carry dressings or cotton upon them, all we need is two dishes, one with phenol and another with alcohol, and if our instruments are clean and immersed in phenol and then in alcohol, they are safe. You can immerse broaches, plugger points with guttapercha cones attached, and burs, without taking the burs out of the hand-piece, in these solutions. The dressings that go in the canal, if the hands are not sterile, must be sterilized after the cotton is wrapped on the broaches. It is a simple thing for the operator to have a number of broaches with metal handles so that heat will not hurt them and a dry oven in which these may be sterilized. The heat for such an oven may be obtained from an electric lamp or a small heating element.

A word regarding radiographs. Dr. Coolidge uses his own radiographic outfit and does his own radiographic work. That is a desirable thing to do if a man will develop the technic, but very many of the radiographs which I have seen taken by men who are devoting time to radiographic work thoroughly convince me that it would not be a good plan for all of us to follow, because I am sure we would not get radiographs sufficiently good to be of value. Radiography is expert work, if it is well done, and personally I have preferred to have the radiographs taken by an expert radiographer. If I could have Dr. Coolidge do it, I would be satisfied. We must lay down a rule for ourselves in practice in connection with the use of radiographs. It is my rule to radiograph the full mouth, all of the teeth of patients, regardless of whether there is any particular indication for so doing. I am finding quite a few aveolar abscesses in teeth which I would never have suspected from an ordinary examination, or from any examination made without a radiograph. We should at least have radiographs made of every tooth which has previously had pulp treatment, or if the pulp is dead when it presents, before undertaking a filling or other operation upon such teeth. The time is certainly coming when the man who practices dentistry right will use the radiograph very much more than it is commonly used today. It must come to be part of our common every day practice.

I cannot agree with the general impression that Dr. Johnson has given in regard to the danger of these cases to the health of the individual. What is a granuloma or an abscess or a rarified area in the bone around the end of the root? What does it represent, regardless of whether there is pus in it or not? Suppose it is a granuloma, what does it mean? It is the reaction of tissue resulting from some irritation. We are told by bacteriologists that if tissue of that type is present anywhere in the body, and if there is infection in the circulation, it is likely to locate in this low grade tissue. It is not a safe thing to have in the mouth or anywhere else in the system. Do you think such a thing would persist in the bone without a cause? If the tooth is extracted, the space fills in promptly. The bone is active, it builds in, and closes it up. If you take a dead pulp out of a tooth that has a blind abscess, oftentimes you see by the subsequent radiograph that the bone fills in and closes around the root. Do you know they are safe? I think you do not.

One thing in the pathology of these cases which Dr. Buckley mentioned tonight, and which we must never forget, is the fact that when we strip away the peridental membrane from the cementum, and that cementum is pus soaked, you will not get reattachment of tissue to that cementum. If you want to study these things do this: take a radiograph showing one of these granulomas, and extract that tooth and examine it. You will find a little wall of granular tissue attached to the root, which corresponds to the position of the hole in the bone. The peridental membrane had been destroyed over the portion of the root which projected into the cavity. In those cases in which bone has built in around the root following treatment I feel safe in saying that there is no attachment to the root, no matter what the radiograph shows. The case is no safer than it was before. If with these cases that Dr. Coolidge and Dr. Buckley have shown, other radiographs are taken at later periods, they will find what I have found in some cases that I have followed for a period of three years with radiographs taken every few months. I have some in which bone is shown as having built around the end of the root, and any one would pass them for normal cases. But three months later the same cases show a considerable hole in the bone again, and if taken four or five months later the bone may be built down again.

Dr. Buckley:

How do you explain that?

Dr. Black:

With the removal of the original infection the resistance of these tissues has enabled nature to build bone about the end of the root. I am of the opinion that bone builds down or closes around the end of the root, and in the radiograph it looks to be normal, but it is not attached. There is a little space left there just as there would be around anything else that is encysted by the tissue. There come along some microbes in the circulation and because this tissue is not quite up to par, they attack it and destroy some of it. For the same reason, I think the operation of squirting gutta-percha through the end of the root is just as unsafe, because I do not believe there is the possibility of avoiding reinfection of the surrounding tissue.

In the matter of diagnosis I want to emphasize one thing that has not been mentioned, that in most of these cases which have sinuses, one can tell the condition better with one of Dr. Gilmer's sharp steel probes than with a radiograph. When the probe is passed through the little sinus one can feel how much the end of the root is denuded without the shadow of a doubt. It is one of the simplest things one can do, and one of the most certain. Every abscess that has a sinus should be explored in this way, regardless of whether a radiograph is made or not.

I do not see the logic of leaving such a granuloma or a chronic abscess, or whatever you call it, in the mouth of any patient. Because a man is well, I do not see why we should leave these things in his mouth. Dr. Johnson spoke of the patients of those men who were engaged in the practice of dentistry many years ago. They are all dead.

Dr. Johnson:

Most of them died a natural death.

Dr. Black:

No one dies a natural death. Dr. Charles Mayo said in his paper before the Chicago Dental Society three or four years ago that life, from a very few hours after birth until death, was a constant battle between the human organism and the microörganism, and I add, the microörganisms always get us in the end.

Dr. Truman W. Brophy: I have not anything to add to the discussion of this paper other than to relate an incident that occurred within the last few hours.

This afternoon I received a message to come immediately to the Blackstone Hotel to see a lady who was suffering. I could not go until between 5 and 6 o'clock. When I arrived there I met a physician who came a few minutes later. They had an envelope full of films taken of her mouth. There were some teeth the roots of which had been filled and well filled. There were no darkened areas about any of these teeth except about one bicuspid, near the margin of the gum, which was due to the accumulation of salivary calculus, and one molar about which there was a small darkened area at the end of the root which was perfectly filled. The teeth had all been condemned and extraction ordered. The roots of these teeth had been filled, while some of the others had not. Dead pulps had been ordered extracted. I found that the woman was a sufferer from nephritis, cystitis and rheumatism. I inquired into her case and found that she had had cystitis for twenty-six years, nephritis for twenty-four years, and rheumatism for about twenty years. She had never had a pulpless tooth in her mouth until five years ago. Now, the nephritis, cystitis, and all these maladies were attributed to the teeth which were never diseased until within five years. This chronic condition had been running on for about one-quarter of a century, and now, since the teeth have been devitalized and their roots filled, they must be extracted in order to cure the malady. That is an easy way for a physician to get out of difficulty. If remedies cannot cure his patient he has no means of bringing about relief, and the best thing to do in his estimation is to have all teeth out.

I found that this physician was a man who had discountenanced the wholesale extraction of teeth which is going on to this day without real cause. The area about the tooth root does not mean anything positively. I do not say it does not mean anything, but it does not mean anything positively any more than a discolored area where a fracture has existed means that there still exists a fracture. We all know that a fractured bone will show, months after the fracture has healed, an area the same as it did before the fracture healed. You may make a skiagraph of the patient who has a fracture, you may adjust splints, you may get accurate adjustment of the fragments, with perfect occlusion of the teeth, and then make another skiagraph after union of the bone has taken place, and you should still see lines where the fracture was six months after union has taken place. But does that mean that there is infection? No. It simply means the bone has not become sufficiently dense to show some shadow in the skiagraph that existed in the original bone. This area about the end of a tooth root does not mean there is pus or infection there any more than transillumination of the patient's head showing a shadow on one side is evidence of the existence of infection of the antrum. It does not prove that the antrum is diseased. I have had too many experiences along that line. It only proves that the bone is either thicker on that side, or the antrum may have been diseased and the membranes may have been thicker as a result of the inflammatory process. I have been deceived myself in interpreting bone shadows. A shadow is a phantom, and it is in these cases in which it is misleading.

The sharp probe suggested by Dr. Gilmer is one of the potent methods of discovering an area about the end of a root. You may take a tooth out under the most careful precautions, you may sterilize the tissues round about, remove the tooth, and then make a culture of whatever you find at the end of the root, and in many instances you will not find one trace of a pathogenic micro-organism. This physician whom I met tonight had tried time and again with cultures under the most favorable conditions and failed to find the presence of pathogenic micro-organisms about the end of the tooth roots in this case. I think it is about time for the dental profession to rise in its dignity and proclaim to the people of our community that this thing must end. (Applause.)

Dr. A. E. Schneider:

Relative to the remarks made by Dr. Brophy and now those of Dr. Weston A. Price last week in St. Louis, I will say that they do not tally, and, it seems to me, there is still more studying to be done on this subject by the pathologists and bacteriologists who are studying these conditions.

Dr. Price of Cleveland according to the latest research, claims that pulpless teeth, that were perfectly filled, and where the X-ray picture showed no abscess, infection or inflammation, after removal of the root fillings in a surgically sterile manner, demonstrated pathogenic microbes in the serum extracted from the root canal in the tissues about these teeth and in the scrapings from such teeth. In such instance he was able to grow pathogenic organisms. Such teeth were filled with formalin and sealed for a week, after which they were extracted surgically and from the scrapings from such roots, pathogenic organisms could be grown in every instance.

If this is true, it seems to me there is still more we have to find out about this subject and quickly too. We are apparently divided into two camps. Somebody is wrong, and their researches at Cleveland show that they can always get microörganisms, while Dr. Brophy has said that these men he speaks of could not get cultures. Somebody must be wrong. The researches in Cleveland are carried on so carefully and scientifically that we have to take the word of such men as Dr. Price and his co-workers.

There is another branch in Minneapolis working in conjunction with the research society there, and also in conjunction with the Drs. Mayo, and we find that there are men who claim that around live teeth, suffering from gingivitis, germs are crawling up through the inflamed gingival tissues and causing abscesses along the side of the roots and if this is true, there is another condition we must take into consideration.

Personally, I am at sea as to what is the best practice for my patients where pulpless teeth are involved.

Dr. Brophy:

I did not say that pathogenic microörganisms are never found there.

Dr. Schneider:

I believe you said it is hard to find them, but Dr. Price claims he is always able to find them.

Dr. Brophy:

We get them in the whole body for that matter.

Dr. Schneider:

Is this or can this be true in a healthy man? Surely not of the streptococcus variety, unless there has been or is somewhere a focus of infection in the individual.

This leads us up to the definition of health and disease, the resistance of the body to all infections, the portal of entry of pathogenic organisms, etc., an endless opportunity for discussion.

Dr. Arthur D. Black:

I want to express my agreement with Dr. C. N. Johnson on at least one point. I could not emphasize more strongly than he and Dr. Brophy have done the errors many physicians are making interpreting radiographs of the mouth. I feel as strongly on that point as they do. But that is not the point I was discussing.

I want to say a word in reference to what Dr. Brophy said a moment ago, that organisms have not been found in examining these cases of so-called granuloma. There are one of two reasons for that, namely: either there has been something wrong with the technic, or else the organisms were not there. Either one is quite possible. There is just the reason these things have happened in the case in which bone was destroyed and was later rebuilt. There was a time when the amount of infection there was at a minimum, but that does not keep the tissue from being reinfected. There may be a hole about the end of the root, one examination may show it not to be infected, while another examination might show it to be infected.

There is one other thing that will come into this whole problem, and that is the matter of cyst formation in these tissues. We have a layer of epithelial cells in the peridental membrane. Nobody knows what they are there for. We have found many cases in which evidently infections of the peridental membrane have been encysted and enclosed by epithelial cells and destroyed.

Dr. Buckley:

Do these cysts do any harm?

Dr. Black:

They are subject to infection.

A Member:

Do you advise the extraction of these teeth?

Dr. Black:

To say yes or no might lead to a misunderstanding. I will say this: if the end of the root is sticking up in a definite cavity in the bone, I either extract the tooth or cut off the end of the root, and in the very large majority I extract the tooth.

Dr. L. L. Funk:

I was pleased to hear Dr. Coolidge say that instruments and cotton used in treating teeth should not come in contact with the fingers. He did not tell us how we could do this work. It is a matter that I have experimented on for a great many years. The method of wrapping cotton on needles with the fingers, as practiced, has passed. It does not make any difference whether the cotton is sterile or not, it carries with it dead epithelium and poisons that are thrown out of the system and by perspiration. I have been trying for years to get around this method of wrapping cotton on with the fingers. I went to work and finally developed a machine whereby cotton can be wrapped upon needles in a sanitary manner. In the first place, I was not satisfied with wrapping sanitary cotton on the needle alone, so that I provided all the means of sterilization and processes that I could figure out, and I think I have provided every method of sterilization known to science. In the first place, before the cotton is handled at all by the operator or at the time it is taken out of the original package, which is supposed to be sterile, it is placed in a dry oven and heated at a temperature of 290° F. It is taken from there and placed in a container which is sterile, a formaldehyde container, and then drawn out between celluloid lids which have been previously sterilized, and the whole field of operation is rendered sterile. Then the needle is placed in contact with the cotton, and the cotton is wrapped upon the broach neatly and antiseptically. Before the needle is placed in contact it is drawn through a sponge containing an antiseptic of phenol and eucalyptol. There is a steam sterilizer, a drying sterilizer, a medicinal sterilizer, and vapor sterilizer. After the needle is wrapped with cotton, it is placed in the dry sterilizer and subjected to 290° F. My needles are subjected to that temperature. There is a steam boiler provided with which it is possible to sterilize the steam if you care to. We often place root canal fillings in the dry heat sterilizer and run the temperature up to 290° F. One would naturally that gutta percha points would not stand that degree of heat, but they will stand it nicely. By the way, I made some glass rod models cemented with gold and found it is physically impossible to use glass by the method that we have been using by taking cotton and whirling it around in the canal and taking it out. It is impossible to do it with paper points. The only means with which that can be done, so far as I have been able to find out, is to pack cotton down into the root canals at the apex, pack it until it spreads and comes in contact with all surfaces of the canal wall; then you take the cotton out, you take out the debris, consequently the root is cleaner than it can be done by any other method.

Dr. Coolidge (closing):

I think the subject has been very thoroughly discussed, and although I have a number of things I would like to say, I do not believe it is necessary to say anything further. Every one must meet this situation face to face and the future will probably show us how well we mastered the problems in root canal operations.

Dr. Black said he believed the time was soon coming—I think the time is here right now—when radiographs should be more generally and commonly used by dentists. Dr. Black referred to Elbert Hubbard. I am going to quote from the same writer a verse appropriate for root canal operators, and some of you may recognize the resemblance to something that you learned many years ago:

"Now I get me up to work, I pray the Lord I may not shirk,
If I should die before the night, I pray the Lord my work's all right."

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

A TYPICAL CASE.

Usually the editor of THE DENTAL REVIEW disposes of communications such as the following in other than an editorial way; in short, he writes personal letters, and lets it go at that. But this case is so typical and so disheartening that it has seemed worth while to try, if possible, to aid not only the writer of the letter, but some of our readers as well. The letter is from one of our esteemed readers in Alabama, and is as follows:

> January 31, 1917.
>
> Dr. C. N. Johnson, Chicago, Ill.
>
> Dear Doctor:
>
> Occasionally I have a patient with an excessive flow of very ropy saliva and the teeth just decay faster than I can fill them, almost. Probably I will dismiss them with all the cavities I can find filled, and in from three to five months they will return with other large cavities and probably a pulp involved. Caries at the gingival margin is usually very prevalent in these mouths.
>
> Such cases as I have described are very discouraging to me as well as to the victim, and I should like to know if you can offer me any means of relief.
>
> Can't you write something for THE DENTAL REVIEW that will help those of us who don't know how to combat such cases? I am sure that many of its readers feel just as helpless in these cases as I do, and would welcome an article by you that offers relief. Probably something has already been written that I ought to have seen and that would have helped me out of this trouble but I have failed to see it.
>
> Thanking you in advance for any help you can give me I am.
>
> Most sincerely yours, F. A. J.

The good doctor in this letter recites a class of cases that thinking men in the profession have worried over ever since they worried over anything. As he says, they "are very discouraging." Let us add on the other hand that they are by no means hopeless. It is the rarest thing imaginable where one of these cases of extreme susceptibility to decay cannot be cleared up and the teeth saved. It is a matter of changing the environment, for be it said that this manifestation of rapid and extensive decay is due not so much to the character of the tooth structure as it is to the conditions which surround the teeth. The question arises, how are we to change the environment? To do this requires the co-operation of the dentist and the patient, and let it be understood at the beginning that unless the operator can secure the aid of the patient in these cases he will be practically powerless to control the trouble. A vigorous propaganda of prevention must be undertaken at once, and the disease fought in a systematic way. Instead of seeing the case every "three to five months," it should be seen every month for a time. In addition to filling all cavities of decay, the teeth should be given a careful "prophylactic" treatment each month by polishing the enamel bright and clean and removing every vestige of foreign material from it. This should be supplemented by the patient in a most thorough cleaning of the teeth at least three times a day, and as the operator sees the teeth each month if there is evidence of neglect the patient's attention should be called to it. Eternal vigilance is the price of saving teeth under these circumstances, and for a time the results may be disheartening, but sooner or later, with this kind of effort, the case will begin to clear up and the evidences of extreme susceptibility will gradually subside and the teeth be saved. This is the usual history of these cases when handled properly, and the result is well worth the effort. It is true that occasionally we find a case in which susceptibility seems to persist indefinitely, but this is rare; and a dentist may confidently undertake to control the average case provided he can enlist the aid of the patient.

To summarize—fill all cavities the moment they appear, prevent cavities as much as possible by prophylactic treatment and by care on the part of the patient, and see the case frequently enough so that large cavities do not occur. If this is done it will be seldom or never that decay will occur to the point where "the pulp is involved." It is true that there are discouraging features connected with these cases, but when the operator has finally succeeded in controlling the situation and has won out by saving the teeth, there is no achievement greater than this in a professional way, and no satisfaction equal to it in a sentimental way.

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. III.

My Dear Boy:

Having grounded yourself in the fundamentals of correct professional conduct and consecrated yourself to their observance, you still have much to learn about conducting a practice. The first thing is to know how to do your work well. In the vernacular, you must be able to "deliver the goods." Of course I hear you say that you learned to do this in college, but did you? That is a question for every recent graduate to ask himself. You may have become sufficiently proficient to pass the examinations, and convince the faculty and state board that you were qualified to take proper care of the people. But faculties and state boards are not infallible, and they may have misjudged you. They often do. Then again they may have been in a charitable mood, it may have been too disagreeable to reject you, and they may have let you through by grace of a magnanimity for which they are seldom given credit. In any event many a young man is given his diploma and license to practice without being as well equipped as he should, and—be it said in passing—some young men are rejected who could acceptably serve the public. Faculties and members of state boards are very human.

But you are launched, and the problem is yours of sailing your craft well or ill. If you find, as you may, that you are deficient in technical skill, then face that fact in the most practical manner and never rest till you have corrected the trouble. There is no reason why you should not become as good an operator as any man. You may not be by nature so proficient as some, it may take more effort to perfect your skill, but it can be done. The keynote of success in this particular is application. "Keep everlastingly at it." The older men in the profession will help you—they will be glad to. That is the glory of dentistry that every man who knows is anxious to impart his knowledge to those who do not know. Identify yourself with study clubs if you can. If none exist in your locality, organize one, and then work to keep it alive. The first requisite for perfecting yourself in the technique of dentistry is work, the next is more work, and the next is still more work.

As soon as you have learned how to perform good operations—perform them. Always deliver your very best regardless of the time it takes. You can shorten up on your time when you become busier, though you should never sacrifice quality for speed. You will find the ability to do good work to be one of your greatest assets, and it will not take years to demonstrate the fact to your patients that you can do the work. Patients are more discriminating than they are given credit for, and they intuitively read in a man's every act whether or not he is proficient. And just here is where many an operator deceives himself. He takes it for granted that the patient is unable to judge of good service, and he falls into the habit of slighting a little here and a little there, till before he is aware of it he has lowered the quality of his work and dropped into a slipshod way of doing things. There is a great temptation to do this. In work as tiresome as dental operations there is ever the tendency to let down. But it is a fatal mistake to make. Habit is a powerful factor in the affairs of life, and the habit of slighting operations grows on a man. It will ruin him if he allows it to become chronic. Sooner than he imagines the patients learn what is happening, and there is nothing that will drive them from him quicker. They do not have to patronize a man who does poor work now-a-days, because there are too many who do good work. Time was when dentists were few and people knew little of dental work. It was possible then for an indifferent workman who was glib of tongue to sail along for years in the face of slovenly service, but not so now.

You may as well realize, my boy, that you have entered a calling that is very exacting—where the necessity is ever present of keeping yourself keyed up to the keenest pitch, and where drifting along the line of least resistance will never do. And in this reflection there should be no sorrow or discouragement. In fact, there should be inspiration and happiness. There is no other satisfaction in life quite equal to that of contemplating a deed well done, and if in the early years of your professional life you hold yourself rigorously to the highest ideals of technical service this kind of service becomes a matter of habit with you, till the time eventually arrives when it is easier for you to do good work than poor. This condition of mind and skill is well worth striving for, because in it lies the only certain road to an increasing satisfaction and pleasure in your work as long as you practice.

The ideals of life are never reached without effort and the road to the top is often strewn with jagged boulders which make the climbing painful and hard. It seems strange that the great things of life are never achieved without the dull discipline of preparation; and the heights are never attained save through the hum-drum process of much plodding. The lesson for you, my boy, is to learn to plod.

Sincerely your friend,

C. N. J.

BOOK REVIEWS.

PHYSIOLOGY FOR DENTISTS. By *R. G. Pearce, B. A., M. D.,* Assistant Professor of Physiology, University of Illinois, Chicago, and *J. J. R. MacLeod, M. B., D. P. H.,* Professor of Physiology, Western Reserve University, Cleveland, Ohio. 320 pages—59 engravings and ten full-page color plates. Second edition, completely revised and rewritten. Price, silk cloth binding, $2.50. Published by The C. V. Mosby Company, St. Louis, Mo.

While this book was ostensibly written for dental students, yet it will be found sufficiently comprehensive for students and practitioners of medicine as well. It is clearly written, much to the point, and very entertaining throughout. The chapters on the circulatory system are especially good, and the one on the Ductless Glands, while short, is very interesting and instructive. The book, as a whole, is to be commended most cordially.

ANATOMY AND HISTOLOGY OF THE MOUTH AND TEETH. By *I. Norman Broomell, D. D. S.,* Professor of Dental Anatomy and Clinical Dentistry, Philadelphia Dental College, and *Philipp Fischelis, M. D.,* Associate Professor of Histology, and Demonstrator in Embryology, Medico-Chirurgical College of Philadelphia. Fifth edition, revised, with 368 illustrations. 467

pages. Cloth. Price $3.00 net. Published by P. Blakiston's Son & Co., Philadelphia.

This book has successively gone into so many editions that this fact constitutes it as standard of its class. It is logically divided into two parts—the first on anatomy of eleven chapters, and the second on histology and histogenesis of nine chapters. A very commendable feature of the chapters on anatomy consists in an illustration of each tooth, showing its various stages of development by years till its full growth. Thus the reader may tell at a glance the probable stage of development of any tooth at any year of life. The. descriptive matter and illustrations of the chapters on the teeth are particularly good and in themselves are well worth the price of the book. At the end of the work there is a very interesting and instructive chapter on Anomalies, showing some very grotesque formations illustrative of the freaks of nature in this respect. The book is in every way worthy of the splendid reputation it has made in the past, and the present edition will in every way enhance this reputation.

FUNDAMENTALS OF PATHOLOGY. By *Paul G. Woolley, B. S., M. D.*, Professor of Pathology, The University of Cincinnati; Director of the Pathological Institute of the Cincinnati General Hospital, Cincinnati, Ohio. For students and practitioners of dentistry. 184 pages—81 illustrations and one colored plate. Price, silk cloth binding, $2.25. Published by the C. V. Mosby Company, St. Louis, Mo.

The charge is frequently made that students of dentistry are not sufficiently drilled in the essentials of pathology, that in short they are not given in college a just conception of what is sometimes termed "the pathological sense." Whether or not this charge can be sustained the fact remains that any addition to our means of teaching pathology must be welcomed, and this book is in this category. The author modestly says that the volume makes no pretense of being complete, but that it hopes to make it possible for students to get a bird's-eye view of the problems of pathology, and of the methods of disease. This is precisely the impression one gets from reading the book. It is not overburdened with useless detail, and yet it gives a vivid portrayal of the essential facts in disease. The chapter on "Disturbances of Metabolism" is particularly impressive and merits a study by every practitioner. The paper on which the book is printed is especially good, and the type bold and clear. The thanks of the profession are due to the author and publisher for the production of so fine a volume.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Lubrication for Pulleys:—If your ceiling pulleys or your suspension engine run dry and you have no pulley oil, use vaseline.—*James W. Cormany, Mount Carroll, Ill.*

Frost Bites:—Our dear old friend Dr. Geo. W. Cook advised tincture of iodin for frost bitten ears once, and it not only cured them but the good advice has been passed on and on. Try it. And a big dose of castor oil internally immediately will always relieve the capillaries as well as the alimentary canal. Nothing takes the place of castor oil and it is indicetad even in diarrhea.—*Homer Almon.*

To Prevent Cracking of Porcelain Teeth in Soldering:—Use two backings. Paint whiting on the lingual surface of the facing. Burnish 32 gauge pure gold over the lingual surface of the facing as backing. Then burnish a second backing over the first one about 28 gauge, drilling a hole through the second backing to permit the solder to flow through and connect the two backings. Split the platinum pins.—*A. Berthold, Chicago.*

To Loosen Teeth in Advance of Extraction:—If the patient is willing to submit to some discomfort in advance of the operation —as many of them are—the tooth may be loosened and made to extract much more easily by slipping around it a small rubber band and letting it remain for a few days. The band will create sufficient irritation to perceptibly loosen the tooth so that it may be extracted quite easily.—*F. J. Patterson, Mendota, Ill.*

To Solder Dowel Pin to Floor:—In making band or partial band cope for crown time may be gained if instead of investing same a bit of asbestos fibre is made wet and carefully shaped with fingers to the pin and floor on the surfaces to be in contact with root. Then heat and as the water evaporates the asbestos becomes quite dense and holds the relation correctly when the pin and floor are united, the whole operation requiring but one or two minutes.—*J. F. F. Waltz, Decatur, Ill.*

To Secure Exact Occlusion:—For full sets of teeth, it is often difficult to get the occlusion exact and "flat." Some prosthetists take emery flour and mix with oil. After remounting on the anatomical occluding frame they smear the grinding surfaces with this, then work the sets and gradually wear the occluding surfaces until they close "flat." This is very tedious Avoid this by smearing upon these surfaces hydrofluoric acid, being careful to use fresh acid and only a little. Set the case aside for 2 or 3 hours. Now smear with emery powder and oil and the surfaces will easily wear down to that very desirable solid and flat occlusion. This also removes the glaze. The teeth will not dance or tip, other things being equal.—*E. J. Perry, Washington, Iowa.*

To Cut Off an Anterior Tooth:—In cutting off front teeth it is best never to use the incising forceps. They jar the patient in more ways than one—and may start a fracture that will later wreck the root. A very quick way to do the job is to cut a transverse nick, close up against the gingival margin, with a knife-edged stone. When this is well through the enamel take a rather small cross cut fissure bur and work it back and forth laterally, at the same time deepening the cut toward the palate with each transverse sweep. The advantages of this method are, its great speed (any tooth in the front of the mouth may be cleanly cut off in two minutes of actual operating time provided *first-class* stones and *new burs* are used), minimum of jarring and disagreeable noise to bother the patient and, lastly, it is not a "mussy" proceeding.—*Arthur G. Smith, Peoria, Ill.*

To Cast a Gold Inlay in Which a Part of the Inlay Extends Deep into the Pulp Chamber of a Pulpless Tooth:—Use any good wax for the model which you are accustomed to work. Press the wax well into place, and when properly burnished select a wire sprue of the same size that you would use if you intended to use a gold wire cast with the inlay. Cut the wire long enough so it will reach as far as you desire into the pulp chamber, and half an inch or more outside. Put as much point as desired on the wire, warm sufficiently over a small flame and insert directly through the wax model into the tooth cavity. The wire will push the wax well down in the cavity and also crowd it against the walls, and when cold it makes a firm handle with which the wax is easily withdrawn from the cavity. After the wax is invested and the material hard enough, heat the outer end of the sprue just enough so it may be easily withdrawn with a small pair of pliers. Any sort of wire will answer for the sprue only adapt the size to the inlay and root canal. The pointed end of a medium sized safety pin cut to length will answer in many cases, a piece of brass or gold wire of suitable size will do; only be sure to withdraw the wire even if it is gold. This method of casting is very desirable where a gold inlay is to be faced with any of the silicate cements.—*Geo. D. Sitherwood, Bloomington, Ill.*

Exposed Pulps in Deciduous Teeth:—The pulps of deciduous molar teeth become exposed by caries very early in the lives of our little patients, at the early age of four years and even younger. One of the most difficult things that such young patients have to endure is to remain quiet long enough for the dentist to render required service. It often occurs that the young patient is fretful and cries the most of the time while in the dental chair. To render service to an exposed pulp for such a patient borders upon the impossible, and yet the deciduous molars must be preserved and held in the mouth until near the time for the eruption of the bicuspids to take their places. For many years I have dealt with such cases in the following manner with great success, therefore my method is not an untried theory. As early as possible in the treatments of exposed pulps in the deciduous molars I apply a little devitalizing paste and secure it in the tooth with cement or amalgam. I then tell the parent of the child that I will not treat that tooth again so long as it remains comfortable. If it causes any discomfort bring your child to me for another treatment. In ninety-five per cent or more of such cases there is no occasion for any further treatment which makes it easy on the child and enables the dentist to escape much of the most trying ordeals of his professional life.—*H. A. Cross.*

MEMORANDA.

ILLINOIS STATE DENTAL SOCIETY.

The fifty-third annual meeting of the Illinois State Dental Society will be held at Quincy, Illinois, May 8, 9, 10 and 11, 1917. J. P. Luthringer, Secretary.

MASSACHUSETTS DENTAL SOCIETY.

The fifty-third annual meeting of the Massachusetts State Dental Society will be held on May 3, 4 and 5, 1917, at Springfield, Massachusetts. J. Arthur Furbish, D. M. D., Secretary.

CONNECTICUT STATE DENTAL ASSOCIATION.

The fifty-third annual meeting of the Connecticut State Dental Association will be held at the Hotel Griswold, New London, Connecticut, June 14th, 15th and 16th, 1917.—Geo. S. B. Leonard, Secretary.

MISSOURI STATE DENTAL ASSOCIATION.

The fifty-second annual meeting of the Missouri State Dental Association will be held at St. Joseph, April 4, 5, 6, 1917. Members of the Missouri State, National Dental Association, and all members of State Societies are extended a cordial invitation.—J. G. Leftwich.

TENNESSEE STATE DENTAL ASSOCIATION GOLDEN JUBILEE SESSION.

The Golden Jubilee of the Tennessee Dental Society will be held in Memphis, June 19, 20, 21, 22. The officers promise the most attractive program ever presented in the South. Social features will be prominent. All ethical dentists invited—come and bring your wives.—D. M. Cattell, President; C. E. Hines, Secretary.

DR. ALBERT B. CRAWFORD.

Dr. Albert B. Crawford, one of Edgar's most prominent citizens, died this morning after a brief illness.

He was born at Crawford's hill, near Mayville, Wis., on July 27th, 1849. He attended school in that vicinity, afterward going to the Albion Academy, and to Ripon College. He studied dentistry at the University of Pennsylvania and received his diploma from that institution. He returned to Wisconsin in 1882 and after spending six months at Juneau and five years at Horicon, moved to Grand Rapids in 1887. He moved to Marshfield in 1906, and after the death of his wife, to Edgar, in 1907.

He has always taken a great interest in his profession and at the time of his death was vice-president of the Central Wisconsin Dental Society.—*Wausau Daily Record Herald, Jan. 22. 1917.*

AN ANXIOUS MOMENT.

The late Dr. Thomas W. Prichett of Whitehall, Illinois, although of Quaker family, enlisted in 1862 and served as a private till the end of the war.

Few had a more thrilling experience than this, of which he seldom spoke.

While crossing an open field from which the small oak timber had been recently cut, his company was attacked on the flank by Confederates in the adjoining woods. By command they dropped to the ground among the stumps which would afford some protection from the enemy's fire; Tom and his best friend, Jim, lay close together, heads forward for the use of their guns. Within a few moments Tom heard the thud of a bullet, stopped by a solid object close to his ear. He thought, "Oh, God! Jim is killed." For one long minute as it seemed to him he could not find voice. Then he said tremulously, "Jim!" "Yes, Tom." "Are you all right? I thought you were struck, and I couldn't speak."

When the firing had ceased they discovered that a stump not more than four inches in diameter, between their heads, had received the bullet squarely in the center.—Garrett Newkirk, Pasadena, California.

New Year, 1917.

EUROPEAN ORTHODONTIA SOCIETY.

My Dear Fellow Members!

Two and a half years have almost passed since we had our last, very successful, meeting!

Hardly could one at that time have believed that we would be obliged to postpone our next meeting so long,—but the terrible war which, since this time, has been devastating Europe, naturally make international professional meetings impossible.

Still the science of orthodontia, in its modification, has made enormous progress in all the different belligerent countries and has proved to be an absolutely indispensable and much needed help in war-surgery, in the treatment of facial wounded soldiers, and it is most gratifying to dental science in general, but to orthodontia in special, that so many human beings, otherwise spoiled for their whole life have, through our art and by our professional brothers, been treated and cured.

Together with our most sincere wishes for you and yours for the coming new year, we express the hope that the interest in our science, when peace is restored, will be strong enough to bring in all our members together again, joined in earnest work for the progress of orthodontia, to the benefit of mankind!—Cordially yours, G. Lind, President E. O. S.
Keizersgracht 542, Amsterdam, Holland.

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS.

The National Dental Association will meet in New York City October 22nd, 23rd, 24th, 25th and 26th. The headquarters will be at the Hotel Astor, situated on Broadway, at 44th and 45th streets. This hotel has the largest ball room in the world, and this room will be used for all the General Assembly meetings. Other large ball rooms will accommodate the Sections, House of Delegates, etc., etc. The Exhibits will be shown in the beautiful Roof Gardens. Thus practically all of the meetings will occur under the roof of this spacious hotel.

Full accounts of the plans of what promises to be the largest and greatest meeting in the history of the Association will be published later. Suffice it for the present to state that the slogan for this year will be:

"QUALITY RATHER THAN QUANTITY."

Nevertheless there will be quantity also. But the important announcement at this time must be the warning. *"Reserve your rooms at once. Make reservations by mail direct to the hotel of your choice."* This may seem premature considering the abundance an variety of hotel accommodations listed below. But New York hotels are always crowded. Nearly seven hundred conventions met here during 1916. October is one of the busiest months. If you desire to get into any particular hotel, therefore, it will be safest to write at once. For example, 150 rooms have been reserved at the Headquarters Hotel, the Astor, already.

A copy of the list of hotels and rates in pamphlet form will be sent to any member of the National Dental Association on application. Please enclose stamp.—R. Ottolengui, Chairman Publicity Committee, 80 West 40th street, New York City.

PREPARDEDNESS LEAGUE OF AMERICAN DENTISTS

WHAT WILL YOU DO IN CASE OF WAR?

The time has come! Our nation is facing one of the gravest crises in its history! As a profession we are in position to render to our government and to our fellow men a service not to be equaled by any other organization of specialists. Will we accept the challenge? Positively and unflinchingly. Yes! We will rise to the fullest needs of the emergency and prove our value and sincerity as a public service agency in our important field.

It is truly said that an army fights on its stomach and teeth. This statement covers the whole situation. As monitors of the teeth we are supervisors of the stomach, hence, an army is helpless without our professional offices. We must, therefore, become a united army within ourselves and throw our whole energy into the work that is before us.

First of all we must have organization. Next must be formulated sane and sound plans for action. These plans must be carried forward by men of capacity, influence and experience. Phe Preparedness League of American Dentists supplies the necessary organization and the following names represent the directors and dictators of the League: Board of Trustees, Thomas P. Hinman, Harvey J. Burkhart, Otto U. King, and Frank W. Low. Advisory Board, representing the National Dental Association, E. O. Kirk, Lafayette L. Barber, Herbert L. Wheeler, H. E. Friesell, and S. D. Boak, Dental Corps, U. S. Army.

It is needless to comment on the peculiar fitness of these men nor to refer to the value of their united efforts in forwarding any movement for the welfare of humanity or our great profession. These men love their chosen calling, live for it each day and no effort or sacrifice within their power is too great to make its usefulness more potent.

We want *you* and every other member of the National Dental Association to join the League and agree to, if possbile, prepare the mouth of at least one applicant for enlistment to the national guard, army or navy, who has been rejected because of defective oral conditions and is unable to pay for the necessary dental service, so that he may meet the requirements of the examining officers. We request that all such work be reported to to the League headquarters.

Next we want you, if possible, to join the Officers Reserve Corps, Dental Section, of the army and equip yourself by joining a Sectional Unit of the League in your city or neighborhood and study the prescribed course in oral and dental surgery which will prepare you to pass the examination for entrance to this corps. Successful applicants are commissioned as first lieutenants with salary of $2,000 a year when in actual service. There is neither number nor age limit and none will be called to service except in event of actual war. The League will supply application blanks and has the assurance of the Surgeon General's Department that less formality will be required of applicants vouched for by this organization.

Our ambition is to give our government the largest, most efficient and most representative Officers Reserve Corp, Dental Section, of any nation of the world. This we owe to our country and to our profession alike. Do *your* part today and thus assure its accomplishment.

All further information regarding Reserve Corps, Sectional Units, etc., may be obtained at League Headquarters. Those wishing to join the Corps, kindly send full name, whether or not a member of the N. D. A., college and date of graduation. If not already a member of the League, we earnestly request you to become so by enclosing one dollar ($1.00) for active membership. This is much needed to cover postage, printing and other necessary expenses, the clerical work being done gratis by the secretaries of the officers of the League. Address, Preparedness League of American Dentists, 3 Professional Bldg., 131 Allen St., Buffalo, N. Y.—*Do it today.*—J. W. Beach, Chairman Preparedness League of American Dentists.

OBITUARY.

DR. ARTHUR HOLBROOK.

Died, at Milwaukee, Wis., on January 23, 1917, Dr. Arthur Holbrook, in his 75th year.

The passing of Dr. Holbrook leaves a wide gap in the professional activities of his adopted state, as is indicated by the following account taken from the *Milwaukee Sentinel* of January 24th:

> Dr. Holbrook, who was the son of Edwin A. Holbrook and Lucinda Richardson Holbrook, was born in Madrid, St. Lawrence county, New York, June 4, 1842. He first studied dentistry under his father and then under his uncle in Waukesha, Wis., in 1860. He enlisted at the outbreak of the civil war at the first call for ninety day men and then re-enlisted in the three-year service and went to the front as a member of Company F, Fifth Wisconsin Infantry. He served as sergeant of this company through the memorable campaign on the Potomac from July, 1861, to the fall of 1862, when he was promoted to first lieutenant, Company A, Twenty-eighth Wisconsin infantry.
>
> #### IN CHARGE OF INFANTRY.
>
> He was afterward commissioned adjutant of the Thirty-ninth Wisconsin Infantry, and at the time of Gen. Forrest's daring raid on the city of Memphis he was acting assistant adjutant general of the Fourth Brigade at that place.
>
> In the fall of 1864 he was mustered out with an honorable discharge and returned to the study of dentistry. He was graduated from the Philadelphia Dental College in 1867.
>
> Dr. Holbrook and the late Dr. C. C. Chittenden of Madison were the first two graduate dentists in Wisconsin.
>
> In 1868 Dr. Holbrook married Miss Josephine Tenney, daughter of E. P. Tenney of New York state.
>
> Four children survive. They are: Florence L., now Mrs. Barent G. Poucher, Gencoe, Ill.; Arthur T., Hortense, now Mrs. T. H. Spence, and Harold E., the latter three all of Milwaukee.
>
> #### ACTIVE IN MANY SOCIETIES.
>
> Dr. Holbrook was a member of Grand Avenue Congregational church, a charter member and several times president of the Wisconsin State Dental Society, of which he was an honorary life member; founder and first president of the Milwaukee Odontological Society and at his death an honorary life member of the National Dental Society.
>
> Dr. Holbrook was also active in fraternal and military organizations. He was a charter member of Lafayette lodge, Free and Accepted Masons, and a charter and demitted member of Calumet chapter, Royal Arch Masons; member of Ivanhoe commandery, Knights Templar; member of E. B. Wolcott post, G. A. R.; member, former commander and at his death chaplain of the Wisconsin commandery of the Loyal Legion of the United States; member of the Association of the Fifth Wisconsin Volunteer Infantry and a member of the Association of the Twenty-eighth Wisconsin Volunteer Infantry.
>
> He was the author of many valuable writings on dentistry and other subjects.

Funeral services will be held Thursday afternoon at 2:30 o'clock from the home of Dr. A. T. Holbrook, with interment at Forest Home cemetery.

Thus is chronicled from the viewpoint of the lay press the life and death of this splendid man. It is hard for those of us in the profession who knew him well to bow resignedly to the inevitable edict which took him from our midst. The editor of THE DENTAL REVIEW knew him well and loved him devotedly. On the occasion of a banquet tendered to Dr. Holbrook in Milwaukee, January 21st, 1914, the present writer in commenting on the event had this to say: "When the name of Dr. Arthur Holbrook is mentioned in any gathering of dentists in Wisconsin there is not a man who does not instinctively feel like taking off his hat. Never was a man more universally beloved and never did a man more richly deserve it. The writer of this article has known him for many years and he counts this circumstance as one of his rarest professional and personal privileges. Arthur Holbrook could never think a mean thought, or do a wrong act. He makes no compromise with himself, while with others he is charity and grace, and forgiveness. He is one of the best writers and clearest thinkers in the dental profession, and in after years when his articles are read they will bear out this statement. And—he is modest, so modest that it is hard to dig him from his shell, but this only endears him the more to his friends. Much could be written of the virtues of this man, but if too much were written he would really suffer from embarrassment. There never has been in the dental profession a more lovable character than that of Arthur Holbrook, and there never will be."

Having thus written of him while he was living it merely remains to pay my tender tribute to his memory when he is gone. He was a great and good man, and more than this cannot be written of any.

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THE
DENTAL REVIEW.
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THE PRESENT STATUS OF OUR KNOWLEDGE OF THE RELATION OF MOUTH INFECTION TO SYSTEMIC DISEASE.*

BY DR. WESTON R. PRICE, CLEVELAND, OHIO.

Mr. Chairman, and Members of the St. Louis Dental Society.

Without any introduction whatever of this particular subject, I shall ask you to consider with me one thing: That the acquisition of a new truth is identical with the acquisition of a new sense, for with it you can conceive, perceive and recognize things that you could not recognize before you had that new truth, and with that new truth you can perceive things that people without that truth cannot perceive. Have you got it? The acquisition of a new truth is identical with the acquisition of a new sense.

Let me give you an illustration. You take your little child out into the woods with you in the summertime when everything is dry. And you take your little revolver or your gun along, and you take some matches and a sharp knife or two. You do not leave them where that child can get hold of them. The child knows what a match is, it can strike a match, but the child does not know the danger of a fire.

Another illustration: Some twenty-three years ago next month, I was in Grand Forks, North Dakota, and came down with typhoid fever. One day I found myself lying on a cot in a hospital there with a physician on each side of the cot who were arguing, and almost coming to blows in discussing the question as to whether or not there was any truth in the germ theory of disease. Only twenty-three years ago; and the man who did not believe in the germ theory of disease was perfectly consistent in that belief, for his method of sterilizing the temperature thermometer when he took it from my mouth was to wipe it on the sheet of my bed. I need not tell you that I contracted such things as erysipelas, as did nearly all of his patients, because we all used the same temperature thermometer. That man did not have that new sense, which I am going to call the "infection sense."

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*Delivered before the St. Louis Dental Society, 60th anniversary, November, 1916.

When I started to practise dentistry, twenty-three years ago last June, I was just about as ignorant, and as incompetent to practise dentistry, as that man who did not believe in the germ theory of disease was to practise his profession, notwithstanding the fact that I had graduated at one of our best universities. I am proud to say the University of Michigan, than which there was no better school in the world. Nevertheless, I was utterly incompetent to practise dentistry, and when I think of the knowledge that I had at the time when I started practising and realize the conceit and the confidence that I had, I am appalled today that I should have undertaken the things that I did undertake. And when I see some of the operations that I made fifteen, eighteen and twenty years ago, and see the results on the patients, and when I take some of those same teeth that I filled the roots of fifteen years ago and refilled their roots ten years ago and others two years ago, and have later extracted and examined my work, I am believing that I am just about as ill-prepared to practise dentistry today as I was twenty-three years ago. I have not yet got that new sense that is going to be necessary before I will be competent to practise dentistry, and I am going to show you some of the things that I have been finding out about some of my own imperfections.

I am proud to say that American dentistry has perfected the artistic side of its professional work to a very high degree, and I am here to command every good operation and every good effort that our professional men are making. Gentlemen, I am not here to condemn you and your work, but I am here to condemn my own work and my own practice, and that involves yourself if you have been following the same.

Now, as we undertake to get a little vision of this "infection sense," I am going to ask you to consider with me first some of the things that seem to be sufficiently well established so that we shall not need to spend much time discussing them, namely, the relation of infections of the body to focal infections—not necessarily of the mouth, but focal infections—and then we will take up some of the newer contributions to this science, and lastly, if we have time, some of the problems that we are undertaking to work out at this particular time. If after that, there is time to show the motion pictures of these various developments, I will be glad to do so.

We will have the slides as soon as the operator is ready, and he will show you first the Research Institute of the National Dental Association. I will take just a moment to tell you that while I am here with you one of the big corporations with considerable money, in the East, is holding a meeting of its officers today to consider our application for financial assistance. I want you all to be in a spirit of prayer while they are having that meeting. I do not know whether they will consider us favorably or not. I do know this, that if they ever had an appeal that was backed up by stronger endorsements, it must have been a strong one indeed, for we have something like fifty endorsements from the very strongest men that can be found in the United States in any profession, leaders of the medical profession, the great surgeons, philanthropists, leaders in the dental profession, and I have strong confidence that they will hear that appeal.

I want to tell you, too, that at the present time we are working under an arrangement of a budget of $20,000.00, and that we shall need at least $30,000.00 this year. The budget this year is furnishing us thirty workers, technicians, etc. The work is being carried on in different cities besides Cleveland, where a staff of nine is working, and I believe that you will be proud of the work that is done at that institution as well as by the directors of research. We are making the money spread around as much as we can.

This slide will show you the exterior of the building, and the second will show you one of the interiors. We have two splendidly equipped operating rooms. Of the $6,000.00 worth of equipment in that building, $4,000.00 worth has been donated gratuitously by individuals and manufacturers, and every contribution has been with the understanding that it carried with it no leverage nor opportunity of advertising.

That is the Research Institute of the National Dental Association. (Applause.) It is a building with thirty rooms and costing $50,000.00, of which $30,000.00 has been contributed and over

$20,000.00 paid in. (Applause.) The dental profession has contributed in cash and pledges to this time a little over $100,000.00 for the building and for the researches. The payments amount to a little over $50,000.00 of that $100,000.00.

This is one of the operating rooms, and it is not different from any of the others, except that as you see it, it is not perfectly equipped; but we have great reason to be proud of the equipment, it is as good as can be bought.

I wish you first to observe with me a few cases that seem to be typical of localizations from oral infections. This is an obscure case of dental infection of the lower incisors, of twenty years' standing. The patient had a boil on his chin, and a physician treated the boil. Some years afterwards a brother of the patient, a dentist, discovered that one of the incisors was discoloring and he took out the putrescent pulp and put in a root filling, which was imperfect. He did not observe that the other central was dead. This patient then carried a dead pulp for twenty years. The focal infection around this area seems to have been the cause of a lesion in that man's body affecting almost entirely the digestive system, particularly the liver. The man had not worked for four years, and for two years had been completely an invalid. With no other treatment than the removal of the apices of these two roots, the man so completely recovered that he was back in twelve weeks carrying on his business. He has gained so rapidly that he is in splendid health at this time. The significant thing is that the culture taken from this canal that had been closed except as the one end was in the tissues of the patient developed an infection in animals which selected out the liver consecutively, and the next slide will show us a typical liver infection. It is not unlike large numbers of miliary abscesses that we find, but note particularly, for we wish to revert to it, that the infective process has formed around a blood vessel. It is an embolic clot that was infected, and the infective process is felt, then, all through the blood stream.

Another type of case, a woman who has suffered for some twenty years with disturbance of her throat affecting her vocal cords, so that she could not speak naturally and most of the time not louder than a whisper. She can now talk nearly as loudly as I can, and I have a pretty good voice. She has been entirely relieved of the secondary disturbance by the removal of the infected teeth. Her husband tells us that when he was courting her, twenty-two years ago, he could not kiss her on the mouth, because the teeth were so sore—it was no fault of his, that he did not. You notice that this area does not show great rarification, and yet cultures taken from that area, inoculated into animals, produced typical lesions; and this case is simply illustrative of a large group. I have five complete histories where the voice was lost and was restored by the removal of a dental infection.

This is a different type of case. Here is a woman who came to us when we started the work in the Institute a year ago. We did not get a picture of her at that time. You notice the marked deformity of the hands; you notice here that she is standing on her feet. She had not been on her feet for eighteen months either with crutches or the assistance of a nurse. For three years prior to that time she had been limping on crutches. She can now walk alone, and twelve weeks after we had removed the dental infections she was able to walk up a flight of seven stairs with her crutches. She can now raise her hands to her head, and is improving rapidly.

The next slide shows some of the deformities, the elbow being very rigidly fixed.

The next shows the dental condition. You will note, particularly, the areas of infection, and she had had a lot of dental work done. I shall not stop at this time to discuss the methods of culturing.

A different type, iritis. You notice that one of this man's eyes is blurred and the other is normal. We see many of these cases. The last rabbit I examined before leaving, yesterday afternoon, had developed an iritis similar to this that is shown here.

Another type, extreme arthritis. This woman has been getting steadily worse for eight years. She had a family of four children, all of whom had been placed in institutions. She is raising her hands there as far as she can and rotating her head as far as she can. Her husband had to carry her and she would have starved if she had not been fed. Conditions were so bad, and had been bad, for so long, that she tells me her husband had said to her that if he stayed with her she must either die or get better. Remember, her children had been taken away from her, and she had the normal instincts of a mother to love her children and want to hold them. In that desperation she was brought to the institution. That woman today is cooking the meals for her four children in her own home where they have been brought to her. (Applause.) And I think she is very happy, and I think her husband is very happy, for within a few weeks she expects to have a fifth little child to grace that home. Now when I tell you that that one case has been compensation to me for all the time that I have ever given to this work, you will understand it, for that woman's heart goes out to me with an appreciation that our ordinary cases cannot at all give us.

Here is a condition of the spinal column. You will notice how densely filled in the vertebral column is, also the distortion of her hands. In this, you see the dental lesions. Now to me it is a tragic thing that so many of these cases are having as good work revealed as the average dentist was doing ten years ago, or perhaps today. This woman went to a better than ordinary dentist. Here we have the lower bicuspid, which was the tender tooth in that mouth and had a fistula; and I want you to know this, that the lesions which we should be most afraid of with reference to systemic infection are apparently those that produce least local trouble. We find in ten to one of these cases of arthritis that seem to be related to dental infection that there is no fistula present.

Here is a poor woman. You see the gold crown and the fairly earnest effort to fill the root, and in that mouth there were five apical areas of infection, as you see, and only one with a fistula, this bicuspid. Yet that woman had no local trouble. She had been in the hands of splendid physicians in a hospital. They had called in a very excellent dentist to examine the mouth and without radiographs her mouth was announced to be in perfect condition and no danger that her trouble was coming from dental lesions. The dentist who did that, you see, did not quite have the "infection sense."

Here is another very extreme case. This man has not walked for eight years. He has been getting so rapidly worse, or, rather, so seriously deformed that it was an impossible thing for him to attempt to wait on himself. He was just like a statue as he would lie in his bed, and suffered a great deal of pain, unlike a great many of these cases. That man's pain was entirely relieved inside of a month after the removal of the dental infections. His general physical condition has improved so much that he sits up and feeds himself, although he cannot walk yet. He has been entirely free from pain for nine months and is so entirely comfortable that he says, "If I don't get any better, I feel like a well man now." Imagine the gratitude of a man who cannot yet walk at all, yet feels satisfied, feels that it is good enough to be free from the pain he has suffered! We do not know what a terrible life it is. Some of these patients whom I see have the prospect of twenty-five, perhaps thirty-five years to lie dying slowly with arthritis. He was as helpless in his bed as in a casket, and, as we all know, many of these patients live a great many years, terrible as their condition is.

Here are the dental conditions found in that man's mouth. He, too, had been in a hospital and they looked at his mouth there and said that so far as they could see there was not sufficient cause to be found in it. Yet from all these areas of infection we got typical localizations, which I will discuss later.

Certain tissues of the body seem to be elected by the organisms, and here we have a typical stomach ulcer. And the thing I want to impress now is the possibility, as emphasized by Dr. Mayo, that the increase of cancer of the stomach may be due in part to the increase of peptic ulcer, for so many cancers of the stomach are superimposed on ulcer of the stomach, so that the dental infection may indirectly, by the production of an ulcer, produce cancer of the stomach. In other words, a dental infection may be produced which seeks out the stomach for secondary infection and incidentally gives rise to the ulcer, which becomes the site of a cancer.

The mechanism of these infections is of two kinds; chiefly by the blood stream, as in the stomach ulcer where the infective process takes place down in the mucosa and breaks through into the stomach. You can see in animals this process very clearly. There are deepseated infections on the peritoneal side of the stomach, and later you will find it has gone through into the stomach.

The next slide will show us a heart infection. You will note the mass of streptococci and micrococci in the blood stream. Here a heart valve has been affected, and we will discuss that later; but the thing that I want you to have in mind is the mechanism of these things, which is so largely through the agency of the blood stream.

Some of the difficulties of root filling, as suggested by our splendid worker, Dr. Callahan. You will understand the difficulty of filling the numerous foramina, since none of them is in direct line, with free access from the canal.

A still more difficult canal with an island in it.

Another island. This is one of our Dr. Callahan's slides.

Here are some of the root fillings that he has taken out by dissolving the teeth away from them, simply to show you how difficult it is for us to get into these canals with our ordinary technic.

Here we see a canal filled out through the side, a secondary foramen really filled by a dentist who has tried faithfully and hard, and that could not be accomplished by many of our systems of technic.

This is a cross section of dentin, the tubules of dentin, and they are infected with bacteria. Now you will readily understand the difficulty of sterilizing these organisms clear back in these fine canals; and I am not going to say what you can or cannot do, I am simply going to tell you what I cannot do. I cannot put medicament in any canal that I have tried it in, and I have tried to do it in some fifty, I think. In the mouth I have used everything from sulphuric acid to as strong formalin as I dared to put in, even full-strength formalin where I expected to extract, if necessary, I have not in one, single case where the pulp chamber was infected and not suspected of infection beyond the apex, (for there was no life in the tissue by our tests) produced a sufficiently sterile condition so that the dressing of cotton on which I placed that medicament in the canal of the tooth, leaving it there for forty-eight hours, would not grow organisms in the apical fourth of that dressing. Try it for yourself. It is a thing that any one of you can do; all you need is the right kind of technic and the right kind of culture media. I say again, that I have not in one, single case with any medicament that I could use failed to get a growth from the apical fourth of the dressing when I left a dressing saturated with that medicine in the canal for forty-eight hours; and if I left it for seventy-two hours to four days I could then get it up halfway through the dressing. Why, the organisms beyond the teeth themselves, in the tissues, come back into the canal and infect my dressing and my treatments in the canal do not affect the organisms beyond and my medicament that I put into that root canal does not stay in the root canal. Because of the very laws of physical osmosis and physical dispersion, that medicament spreads itself out through the blood plasma, and this blood plasma comes in to take its place.

I wish that I had time to discuss with you some of the newly observed physical laws that can be applied to our work. This is an old one. Every medicament that is in solution, every chemical that is in solution behaves itself precisely as if it were in a gas form and the same molecular pressure as if it were a gas and goes out the solution was not there. That is, if you have two medicaments side by side, one saturated with chlorid, that chlorid behaves with through the other liquid and all the other tissues until it reaches an equilibrium.

Another thing that I wished to bring out is this: There has been some splendid work done at the Research Institute and in other places, most of it not yet published, on our inability to sterilize dentin even when we take it out. Take a number of teeth and invest them in plaster outside of the mouth and put in forty per cent formalin, and you cannot get a hundred per cent sterilization in forty-eight hours, leaving it in in full strength; the organisms will come right back in from that dentin, notwithstanding all you may do. Now what does that mean? There is a whole lot, gentlemen, that we have taken for granted that we have not the slightest reason for taking for granted, and we might as well acknowledge that. We are in the same position as that man was who sat by my cot and argued against the danger of me being infected or infecting any one else on the ground that there was no truth in the germ theory of disease. This is not literally the same problem, but it is also concerned with the interest of mankind, and we will see twenty years from now that we were in exactly the same position.

I want to discuss for a few minutes the splendid work that is being done, that is foundation work, really, on the localizations of organisms and those tropisms that organisms develop when living in certain tissues for certain other tissues. I am going to repeat for emphasis, and, for fear somebody has not got it, this point: The phase that I want to discuss now is the ability of an organism to grow in a focal infection and develop a tropism, or selective affinity, for certain tissues of the body; and that the organism growing, for instance, in a joint develops an affinity for joints, and the organism growing in the appendix has an affinity for the appendix, and so on through many strains.

Now Dr. Rosenow has made this monumental contribution, and I simply repeat it for review. When he has taken organisms from focal infections in cases of mumps, myositis, endocarditis, gastric ulcer, etc., he has found that the strain taken, inoculated in animals, developed lesions in the animals which corresponded with the lesion from which he took the organism in a large per cent of cases. For example, when he took organisms from the appendix and inoculated in rabbits, sixty-eight per cent of them showed the organisms selecting the appendix. When he took morphologically the same organism—that is, a streptococcus—from other sources and inoculated it into rabbits, he found only five per cent selecting the appendix. It was the same way with ulcer of the stomach; sixty per cent selected the stomach, where only twenty-nine per cent selected the stomach and duodenum when he took them from other sources. In cholecystitis, he found eighty per cent selected the gall-bladder, where only eleven per cent from miscellaneous sources did. In rheumatic fever, sixty-six per cent selected points. Then we find forty-six endocardial, twenty-seven pericardial and forty-eight myocardial; where the ratios were eight, fourteen and two when selected from miscellaneous sources. A definite location, you see, on the part of the organism which is more pronounced when you come to erythema nodosum, for he found that ninety per cent selected the skin where only two per cent from miscellaneous strains selected the skin. In herpes zoster, we have seventy per cent. In mumps seventy-three selected the parotid gland, and not a single strain selected the parotid gland when he took them from miscellaneous sources. Yet under the microscope, you could not have told those organisms apart.

As monumental as that piece of work was, Dr. Rosenow has gone one better and has this last year made a contribution in which he has demonstrated the ability of these various strains of the streptococcus group to select nerve tissues, accounting directly for a great many of the reactions of the nervous system which we have not understood, such as neuralgia, neuritis, etc. When he took the organisms from multiple sclerosis and inoculated into animals, he found that in fifty-eight per cent of the animals they selected the spinal cord. When he took from miscellaneous sources, only four per cent selected the spinal cord. Again, when he took organisms from epidemic anterior poliomyelitis, he found seventy-eight per cent selected the spinal cord; from transverse myelitis, sixty-seven per cent selected the spinal cord. When he took them from a typical intercostal neuralgia, he found that seventy-nine per cent selected the nerve trunks. When he took them from multiple neuritis, forty-six per cent selected nerve trunks. From neuritis and myositis, forty-six per cent selected nerve trunks, and fifty per cent the teeth. From myalgia, ninety-three per cent selected muscles; and twenty-six per cent, the heart.

Here the dorsal roots of the spinal column were selected in eighty-three per cent, when one strain was used, and in not a single one of the other strains. That one strain was neuralgia, and we have never before had any idea of what neuralgia is. We have talked about symptoms of diseases; we are going to find, I believe, from this series of researches carried on in different places, some important, hitherto-unknown relations in disease, and sources of disease, particularly with regard to neuralgia.

I want also to call attention to this fact. You have all seen, as I have, that patients will sometimes present with involvement of the pulp of a healthy tooth, and we have not found what it was and, apparently, it goes away. It is a streptococcal infection, for we have now seen a case history where just preceding it by two weeks the patient had an epidemic streptococcus sore throat, in all probability an organism that selected out the pulp of those teeth.

Here we have a typical paralysis produced by Dr. E. C. Rosenow in his experimental work with poliomyelitis, or infantile paralysis, and it is a wonderful tribute to Dr. Rosenow that he has gone to the refuse, as it were, and found the organism, for it had been declared by many of the leading bacteriologists that since this lesion could be produced by a filtrate that went through a Berkefeld filter, therefore it could not be a streptococcus but one of the filterable viruses. But Dr. Rosenow finds that streps. may grow so small that they will go through a Berkefeld filter and then develop in large size afterward, for he has a typical case produced with a streptococcus with a special electivity, and here are the lesions in the spinal cord showing definitely the method of its localization.

Here we have a large number of different sizes; and, remember, the original organism that produced this culture went through a

Berkefeld filter and was smaller than any you see on the field. Yet from that small organism there developed both the large one here and the small one here. Over here is one where probably the whole chain of these cocci is smaller than one in this large chain.

There has been another great contribution during the last year, in addition to this method of which I have been speaking. Dr. Rosenow has made this most important contribution on electivity of nerve tissues, and Dr. Hartzell in his work has demonstrated the fact that the biochemical reactions of the organisms are not related to their virulence or their electivities. Dr. Hartzell and Henrici, then, have developed the biochemical tests into the two groups of hemolyzing and nonhemolyzing. Here are the hemolyzing strains, and the so-called nonhemolyzing, salicin fermenting or nonfermenting organisms, the fecalis, nitis and salivarius. Now the significant thing is that when they have gone through a large number of organisms, a large number of cases with a large variety of strains, they have found that these organisms select out the various tissues without any respect to the fact that they hemolyze or do not hemolyze, or whether they ferment salicin or do not ferment salicin.

Here, then, is a group of the reactions of the organisms. No. One of this group of organisms produces a reaction in the tissue, and the reaction in a tissue is Nature's method of repair. Now we may get an exudate form, or we may have the lymphocytes develop in the tissue, or we may have proliferative growth of tissue; but it mattered not whether it was pyogenes, Group One or Two, or whether it was mitis or salivarius or any of the strains, hemolytic or nonhemolytic, for we have about the same per cent producing these reactions in tissue. Therefore, you cannot by your sugar fermentation itself tell what virulence that organism will have in tissue; at least, that is the suggestion from their work.

We should take a half hour on this one slide, but we can take only about two minutes. This larger column of three charts to your left represents the hemolyzing group; that to your right, the nonhemolyzing. The first seven columns are myocarditis, endocarditis, arthritis, myositis, lymphoadenitis, splenitis, nephritis. You will notice just by looking at the height of these various columns, which show the percentage of animals reacting to each, that there is very little difference in the first seven. Here is one, though, that is very low in selecting; the first, lymph tissue. But, in general, you readily see that the selectivity of the organisms for tissues had almost nothing to do with those biochemical tests. Again, they all show a very high column for infection, independent entirely of the biochemcial reaction in relation to virulence. We also see that the animal's death, or septicemia, was produced in proportion, in part, to the amount of hemolysis, for the hemolyzing strains have produced more dead animals—more virulence, in other words, than in the nonhemolyzing.

Again, when we compare the hemolyzing and the nonhemolyzing by condensing all three columns into one, you see relatively very little difference. That is the point you need to get into your mind, the fact that you cannot tell by growing your organisms on the blood-agar plate whether or not a certain organism will be likely to produce a myositis, an arthritis, or any other one condition.

Again, take these various selectivities for tissues and compare them to the reactions in regard to sugar fermentation. In the group at the top we have the streptococci fermenting both salicin and mannite; in the next, fermenting salicin, but not mannite; in the two next, neither. To those of you who are bacteriologists, this will be a very important and significant contribution. Drs. Hartzell and Henrici have found definite lesions in the brain where the organism used was taken from the brains of patients dying from chorea. We have known very little about chorea, or St. Vitus' dance, but it seems very probable that the rheumatic-fever group of organisms will produce a selectivity at a certain stage of development that will pick out certain brain tissues and will produce a particular lesion which we know as chorea.

One of the very important contributions they have made in that series of experiments has been to show that about half of the cases of heart valve infection were not embolic, but were deposited from the blood stream. Here we have the typical embolic infection in the base of a heart valve, showing that the lesion did develop from the blood stream. The next will show us a heart valve where the vegetation is attached to the tip and has no connection at all with the blood stream; in other words, this one has been affected because the organism was drifting in the blood and attached itself to the valve. So we get both kinds from either strain of organism, whether hemolyzing or nonhemolyzing.

We are very likely to believe that when an organism infects the apex of the root and we have used any one of our various methods, such as ionization, for treatment, and get a filling in of bone around that tooth, such filling in of bone is a proof that we have restored that tooth to natural conditions. One of the rudest shocks I have had lately has been to find that just such a condition, of which I will show you the radiographs, was not in a normal condition although the bone had filled in around. This is taken from Dr. Black's splendid pathology, and you note how the bone has filled in. I use this simply as an illustration of how the bone may be caused to fill in.

Now let me say this, relative to ionization: We have been and are doing a great deal of experimental work with ionization, and we find that ionization seems to stimulate the tissue beneficially. We have, however, this to report—it may not mean anything, for Dr. Rhein has suggested that perhaps we have soaked the tissues over the gingival margin of the teeth from some other part of the body—that where we have used ionization, in all of its forms of application, we have never once failed to get a culture from that apical area by aspiration, whether we did the aspiration immediately after ionization, or an hour after, or a week after, or a month after ionization. And, again, we have found that it seems to make no difference whether we have used zinc or platinum or zinc chlorid or common salt. I wish that I had time to go into the discussion of that particular problem. As I have not, I will only say that we are doing splendid work in the Institute this year. We have one of the very best bacteriologists working with us. He is trained particularly in cell metabolism and the things that take place within cell membranes under various normal and abnormal conditions, and we expect to have something worth while to report later.

I want to give you this suggestion, relative to radiographs. The angle at which the ray reaches the film and the tooth determines entirely whether or not the length of the tooth is any guide as shown by the radiograph of the tooth itself. If we put our ray too nearly parallel, or at right angles to the plane of the tooth, we get an elongated tooth as shown in this case. If we put our angle too high, we get a shortened tooth as shown in this case. If we divide the plane of the film in half and make our ray strike a plane which is halfway between the plane of the tooth and the film, we will have a shadow of the tooth which will be just the length of the tooth; and you can put a large film into the mouth perfectly flat and get just as good a picture of the upper front teeth, provided you get your angle right, as if you tipped it up into the angle of the mouth. It all depends on your bisecting that angle.

This is the instrument we use for aspiration, simply a four-ounce rubber tubing or glass tubing, and when we see a condition that calls for aspiration in a tooth, if we cannot get moisture away, we dry out the area, pinch on the tubing and leave a vacuum there for twenty-four hours, and nearly always find blood serum when we open it up.

I wish that I had time to discuss the problem of over-medication. I would use this as an illustration. I believe the time is, not coming, but is here, when it will be known as a very gross offense to the tissues of the mouth to use arsenic. Here is an illustration. We have put arsenic in this tooth and sealed it in with both amalgam and cement; yet enough arsenic in a few days has come through the periapical tissues and back through the gingiva to produce these large eschars on the tongue and buccal tissues. Here we find the periosteum is almost entirely filled in with a dense fibrous tissue. It is the type of tissue that has a low blood supply, and therefore Nature's own resistance cannot keep it from being infected with blood stream infection. We are probably overmedicating with the medicaments that we are putting inside canals.

I wish now to speak of some of the work that is being done by the Research Institute at Cleveland. This first case is a typical arthritis, the patient having multiple arthritis in the acute inflammatory stage, with rise of temperature about every week. Aspiration with a needle forced through into this area beyond the tooth gave us an apparently pure culture of streptococcus, which when inoculated into animals has produced successively in two animal passages and in seven rabbits arthritis. That was produced in all of the animals. There have been a few other tissues involved, particularly when we used large and over-doses.

The next slide is more interesting. Here we have a patient that I have been responsible for for eighteen or twenty years. Eighteen years ago that woman's hands were photographed and a radiograph made as you see it here. Here is a normal hand and here was her hand. I am sorry that I have not got a picture of her hand as it is today. The fingers are, however, so closed that she now plays the piano with her knuckles instead of her fingertips. Her fingers are entirely closed into the palms of the hands. She has developed an arthritis so bad that ten years ago she began to use crutches and three years ago she could not get around on crutches without some one to help her. Ten years ago, I said to her, "I am afraid this might be caused by your teeth and I would like to make some radiographs." I found a bicuspid with a root filling only halfway to the root. I took that filling out, put in a first-class root filling, as I thought, and went around patting myself on the back because the woman began to improve. But one thing that seems to be conspicuous in these cases is that infection is a relative matter, due to the amount of organisms and the patient's resistance, the kind of organism. This woman, after a period of improvement, got worse until three years ago she was almost prostrated. Then we found a bicuspid on the other side of her mouth, with a putrescent canal. We thoroughly treated and filled that canal. She got a great deal better, enough better so that she gave up her crutches and goes all about the house, so much better that she said that she was even better than she had dared hope to be or had dared pray that the Lord would make her, for she had felt that if she could only leave her crutches alone she would be completely happy. She has now been for about a year in about the same condition.

Now ten years ago, I took out a filling and put in a better one; two years ago, I took out a putrescent pulp, treated as well as I could, and put in root filling. This fall, I said, "Now I want you to come to the Institute and let us study your condition; you are not getting better." She said that she would and did, so I extracted first the tooth that I filled ten years ago after desensitizing the tissues, using the actual cautery and burning the tissue to the bone all around the neck of the tooth, and extraction was a very difficult thing indeed. Cultures grown from the tooth, both from the scrapings of the bone and from the end of the tooth, gave a strain that attacked the joints of animals and three generations of animals have developed an infection in the knees. And in that case I had done just as good root filling as I knew how to do. Well, then, I got after the filling I had put in two years ago, and in that case found pretty good root filling. Then I took out the filling that I had put in two years ago, and that tooth was so difficult to extract that I was afraid I would break it in extracting. There the radiograph shows a density of bone around the apex instead of a rarification, and without exception the animals inoculated, through three generations now, have shown an involvement of the knees, an arthritis.

Again, that patient's reaction has been so marked after each of those extractions that her temperature went up a degree in one case, a degree and a quarter in another, and, in fact, at one time she had an acute rheumatism. She could not find a comfortable place for her hand in the bed after the first extraction; and in the second case the reaction was so great that she had to awaken her husband to help her get her knee covered. Now what does that mean, if it means anything to you or not? I do not know how you are going to explain it, I want you to tell me; but the thing that seems probable to me is, since I was able to get a culture there, that although the filling seemed to go to the root yet a surface was left there in which the organisms could live and did live notwithstanding that the bone grew down right close to the roots.

Now let us see the radiographs. There is the tooth that I filled two years ago, two canals coming to one, as you see, pretty good root filling, and very little rarification, as you can see, about that apex. Here is the one that I put in ten years ago, and that is as far as I could get into the canal. Note how much more dense that bone has got around that tooth; for here is the radiograph that I made ten years ago, here is that imperfect root filling and here it is after I had done it more perfectly, and you note how much more dense that bone is around that tooth. Now I could easily use that as an argument, if I wanted to, that changing a root filling had improved the condition about that tooth. My hands are up, I am a "dead one" so far as answering that question is concerned. My only explanation is that organisms had been growing in that tissue notwithstanding the fact that I cannot by the radiograph recognize an area of absorption.

Now that woman has had this reaction after the removal of those two teeth. She has been so much better that her mother has said to her, "Why is it, daughter, that you do not lie down now every day for a rest?" The daughter told me of that and said, "For two years I have had to lie down because of a prostration, a sort of heart burden, a load that I seemed to be carrying, and since that extraction I have not had to lie down one single day."

Here is another type of case. These are cases that we are running now in the Research Institute. Here is a woman who has a neuralgia of the back of her neck and has had it for years, with a heart condition. I do indeed wish that I had time to give you the case histories of these people and show you how there has been a sensitiveness on the part of the patient to the rheumatic group of infections all during the lifetime—they have all had growing pains when children, for example—and how many of us are getting our case histories complete? We never can know our case until we have a complete case history.

Now this patient has had this neuralgia in the back of her neck, and she came simply to have ordinary dental work done, and if we had been just mechanical dentists we would never have gone any further. But when we were going over her teeth, I said to her, "Now what about the possibility of your health, the state of your health, having something to do with this dental condition that we find here?" She said, "I have come here just to have this dental work done, and I go to my physician about my health; all I want here is to have my teeth put in good shape." "Yes," I said to her, "but perhaps the physician would like to know what we find, and I want to know for my own satisfaction. Now you don't look very well to me and I have known you for fifteen years and I want you to give me the history of your case." So she did, and we examined her and found four or five teeth with apical infections, and those gold crowns, which I am glad to say I did not put on—I have not put on a gold crown for eighteen years—were removed, and when we removed one of those teeth we made a culture and inoculated it into rabbits. Three rabbits, each inoculated with the same culture, but with a different quantity, developed the same lesions of the neck.

Here we have the first generation, the first rabbit infected. See how it is holding its head over sideways. This is the same rabbit, rabbit No. 105. Now in posting that animal, we found a lesion in the back of the neck right where you see the spot on that woman's neck. We took a culture from that muscle and inoculated another rabbit, and here is the other rabbit, with its head held down, as you see. We found several muscle lesions in that animal and took organisms from that rabbit and inoculated another, and here it is. When I came away another passage, the fourth successive rabbit, had developed that same lesion so far as we could tell, and not one other animal this entire year and a half that we have been carrying on these researches has developed that particular lesion.

Now when we started this work this fall, our new bacteriologist said to me, "It has not been demonstrated to me at all that there is any such thing as selectivity for tissues and I think this is just a waste of time." I said, "It makes no difference; that is our problem for this year, and we are going right after that problem."

In this connection, let me tell you another thing. I took the second tooth from this patient and inoculated a rabbit from that second tooth, and it has developed the same lesions. Now the second animal passage has developed it again and with it, as I saw last night, an iritis. This woman has been troubled all these years, as far back as she can remember almost, with pain in her back in the lumbar region over the kidneys, and she has thought that it was due to kidney disturbance, but the probability is that it is simply a myositis. We give all these patients a complete physical examination, probably more complete than ninety per cent of the hospitals in the country give their patients; not only take complete case histories, but have a complete physical examination of every organ in the surface of the body.

Now as we come to the motion pictures, I want you to have in mind two or three things in particular; that is, certain groupings of the organisms. Here we have the streptococcus. For those who are not familiar with it, the name means, "a string of beads." So you will notice in the fields a little string of beads. Here is the staphylococcus, "a bunch of grapes"—growing in a bunch, you see. And here we have the streptothrix, and leptothrix and the spirochetas, such as the pallidum which produces syphilis, etc. I simply give you those general characteristics to help you to recognize the different ones in the pictures.

Now while they are getting ready for the motion pictures, I wish that I might study with you one thing—and there are so many things that I would like to take up—that is, the significance of reactions on the part of patients. The reactions of the patients are very significant, and one of the most important things for you to watch is this: When you have done anything to your patient, see whether or not that particular operation produces some effect on the patient. The patient may not recognize it, so insist on taking the temperature, insist on the patient making a definite record of lassitude, a definite record of increase or exacerbation of certain symptoms they have been suffering with.

I will not tell you anything more important today than this: That when Dr. D. D. Smith eighteen years ago discovered from a clinical standpoint that it was better to clean teeth every month or every six months, he discovered by a clinical means one of the most important discoveries of modern bacteriology and pathology and physiology, namely, that the way to keep well is by constantly stimulating our resistance up to fight the organisms that are attacking our bodies. Some men in their derision have been tempted to call it the "monthly manicure graft," but it is in fact the best and most logical thing you can do for your patient. By giving a frequent, a monthly or bimonthly or weekly, if need be, treatment for pyorrhea you do this thing; you stimulate that body to fight the organism that is attacking it. Have you not noticed this? I doubt if there is a man in the room that has not if he has kept his eyes open at all—that you have seen a response on the part of your patient that was entirely out of proportion to any deposit that you may have removed; and you have wondered when that patient came back a week or a month later and things were so much better how it was and thought, "Well, I am getting credit for an awful lot here, the patient thinks I did a lot for her, and as a matter of fact there was scarcely any deposit on her teeth."

If you will try this little experiment with those cases of taking a bur of some kind—I do not mean a long bur, but it may be simply a little reamer of a very small size, like a large spiral broach—and put it in a handpiece and while it is revolving just go around the necks of the teeth and stir up the contents of the pyorrheal pockets and leave them in there, not as a means of treatment but as an experiment, just stir things up, make things bleed, you produce a reaction that in many cases will put that patient to bed the next day even if you do not remove any tartar at all. Why, Nature's mechanism is to put a whole host of white blood cells into the tissues ready to receive the organisms as they come in. And another thing, there are antibodies, there are chemicals in the tissues ready to neutralize the bacteriological products that are soaking into these tissues and just as soon as you produce a hemorrhage you let those wash out of the tissues and your toxins get into your patients.

The thing that ought to be done is to inoculate the patient with his own germ. If vaccines are ever of any account, they are best when they are made from the very organism and the very strain in the lesion. In other words, a live organism getting into the system from a focal infection will do infinitely more than can be done by taking it out and growing it in a test tube and making a vaccine to inject into your patient, for you modify it immediately you grow it on artificial media. I want you to get the "infection sense," that new sense that will make you just as different from the ordinary dentist as the physician who now understands bacteriology is different from the one back there who did not believe in the germ theory.

I am sorry for your sake that the room is not dark, and I fear the film will be a disappointment to you, since the organisms are so small and we need the best circumstances for showing them.

I want to take this opportunity to discuss another matter. The bacteria that you are going to study as you get interested in infections are so nearly like you that they are really your cousins, if they are not your half-brothers. Every living thing, whether it is a bacterium or whether it is a dog or whether it is a man, lives by the same process. Every cell, no matter what its source, lives by the same process; it must do three things, it must be in the presence of food, it must assimilate food, and it must eliminate. Now we have supposed that our organisms had some wonderful function or property that was entirely different from the things we recognize in animal and vegetable life. It is not so. They respond with mechanisms almost identical with the mechanisms of animal life, and I am going to show you first what you looked like when you were a little one-celled animal. We will show both the ovum and the sperm that fertilizes it, and you could not tell either one from the bacteria that I will show later on the field; they are in every sense unicellular organisms just as the bacteria.

Now when you get an opportunity I wish you would make this experiment. Catch a frog, just pull a little of the mucous membrane out of his throat, after killing him, and tease some of the surface cells off and put them under a microscope, and you will find that these cells will swim all over the field just like bacteria. Swim? Why, they have cilia on them, and those cilia react mechanically and that mechanical reaction of the cilia is the thing that makes the organism swim; and the bacteria that we see swimming about are attracted by certain chemicals which attract the cilia or the flagella. They do not have a mentality, a consciousness that makes them, seemingly, select out those tissues, and the thing that you should try for is to get this mechanistic conception of life. Think of them responding to chemicals just as the chemicals in your test tubes respond, and they all of them respond to irritation just as a frog responds to irritation, etc.

We will first study, for comparison, simply to give us an idea of what bacteria are like, the ovum and sperm of certain of the small sea forms, murex, starfish and sea-urchin. This is a starfish about as large as a person's hand. This is the sea-urchin. In these sea forms about four-fifths of the body is given over to the formation and production of reproductive elements, either eggs or sperm. This, then, is the egg of the sea-urchin, and you will note on magnifying it that it is filled with a granular mass, a little fine network that looks almost precisely like bacteria, and when we put the sperm in the field they are attracted by chemical action to the ovum, and only one is able to get into the ovum because immediately one enters this fertilizing membrane forms about the egg and shuts off all others. This is the fertilizing membrane, and all through the field are the living sperm.

Now we have this first division—for each one of us was first a one-celled organism—and then there comes a two-celled. Here is the two-celled, and we did precisely as this egg is doing, dividing now into four-cell. You note the difference in the shape and the nuclear masses forming, and as those various divisions take place we get finally a membrane surrounding a large number of cells, but always in regular form. Here we have an eight-cell in side view, and here it is in full view. They are as regular as a mechanic could make them, and yet there will be perhape a half-million in one of the small animals. We will also find sixteen, twenty-four, thirty-two, always multiples of two, and finally the swimming forms appear. If you remember back to your embryology, you will remember the three layers, epiblast, mesoblast, and endoblast.

Here is the sperm inverted into the egg just as you would press one side of a rubber ball if you punctured it, and it swims all about in just a few hours after fertilization. I am sorry that the room is not dark. You will not see very much of this, but we cannot help it.

This is the starfish egg and it fertilizes a little differently. If we were studying this from the embryological standpoint we would discuss the getting away of the polar bodies which we see here carrying away the extra chromosomes to make room for the male chromosomes that come in at the time of fertilization. Here we have the sperm, and you could not tell them from the bacteria that I will show in a moment. Here is the egg; watch it being fertilized and you will see a sperm entering at the top. Here one polar body, in this case, comes off before fertilization and one after; one is outside, and one inside the fertilization membrane; and now this fertilization membrane is keeping out all other sperm so that only the first one enters, and the sperm are swimming around the field precisely as the bacteria will. Here is the polar body. Now watch the fissure go through the cell, dividing it into two, with your extra chromosomes carried in this polar body.

Various two-celled stages. Here is your nucleus dividing. Now for your four-celled stage. Now some of these divide so completely that they will fall apart, and if they should fall apart they would make two organisms. That is what happens when twins develop in the human life and are similar—they are due to a split ovum—when they are dissimilar, they are the fertilization of two ova. Now if that egg should divide, two entities would develop so like that you could not tell one from the other, since each has carried the same determinals.

Here we have various developmental stages for chromosomes. The chromosomes do not show, but the nuclear body carries the chromosomes.

Again, the four-cell stage in the mitotic division. The first fissure will be precisely as in bacteria, as you see it here. Here we have our eight-cell stage and the living sperm swimming all about the field for hours after, but only one enters because of the fertilizing membrane. We see the cells increasing in number, and pretty soon it tries to swim. Now this particular type is the starfish, and you see the skeletal forms quite distinctly, forming. Here they are swimming about.

This is murex that we are now looking at. You note the large droplets carrying the food and here is the perfected murex, the three-segment stage. You will notice how perfectly like the cells of tissue taken from the throat they are. I will show you in just a few moments the other cells, and you can hardly tell the difference in the way they behave; in fact, they are precisely identical from a biologic standpoint.

Here are the cilia highly magnified, precisely like the cilia in your throat or mine, and this developed form is almost like the one-unit cells taken from various parts of the air passages of our bodies. Now if we study the ciliary mechanism of such an organism as the frog, we will get the following condition, though this was taken from the clam, I think. There is what I told you of; there are the cilia making a slow swim around the field almost precisely as if it were a bacterium.

Here we have the more highly organized endameba, and you see this vacuum open and close; you see the mass of undigested food. This is growing in water, a good deal like the ameba of the mouth. You see the vacuum open and close just like a shot, and that is the beginning of the operation of a process something like the stomach. These organisms all have digestive fluids just as you and I have.

Here we see the organisms taken from rapid decay of the teeth, that you get in pure culture growing in the decay around the necks of these teeth, a very rapidly motile organism too. Incidentally, the care of that mouth was all that was necessary mechanically to stop the decay.

That shows the method of transferring the culture from the decay to the microscope. The light is allowed to fall on the mirror, passed up through the organisms and reflected through a prism into the moving picture machine to give us that effect.

This is another, higher magnification, a pure culture, as you see, although you could not tell from the picture here that it was.

A general, mixed culture taken from the tip of that mouth gives us this picture. Here we have the leptothrix and the streptothrix and cyst form of the ameba buccalis, a large number of motile varieties, Bacillus longus.

Organisms taken from a carbuncle, which was nearly fatal to the patient. It is almost identical with an organism taken from the bowels in the next patient, this motile organism taken from the patient's neck. Now in the next case, that of carbuncles, the carbuncles had been persisting for several years up to a year ago or nearly so. The man has not had a single carbuncle since. His teeth were treated, at which time we found an infection in the teeth corresponding to this in the bowel. Here we see the organism taken from the bowel. You note this characteristic appearance. It just happens to have been developed a little more when we took it from the teeth, but it is the same organism.

Here we have now the organisms from the patient, and this patient had a molar tooth that had been treated with one of the mummifying pastes about ten years ago. He has the same organism growing in that pulp canal, as you see here.

I want you to note the migration, evolution of the ameba which is blamed by Bass and John particularly for causing pyorrhea. This is Endameba buccalis. It has a pseudopodic motion, throwing out its pseudopods in rhythmic form. If this light were good, you would readily see that these pseudopods have their motion rhythmically in a circular form.

These are erythrocytes, or red blood cells, and leucocytes in the field. It is not probable, then, that an organism which could not swim across the field any faster than these could drag infection into the tissue when there are bacteria swimming all about that could go anywhere they wanted to, with the motion they possess.

Now there is another organism found in some pyorrhea pockets, though not so universally. It is able to travel straight ahead in a given direction for a considerable space. There is a strong probability that it could carry bacteria. On the other hand, why should the bacteria wait for it since they, as you see, are swimming all about it in circles—not the streptococci swimming, but there are motile forms in the field. This organism has not been blamed as the causative factor in pyorrhea alveolaris.

This organism will come to a mass of debris and force its way into the debris. Here is a mass of tissue, probably an erythrocyte or leucocyte that the organism has ingested and will carry with it for some distance.

Now an ordinary dirty mouth will show a mixed infection such as this slide gives us. Here you have Bacillus maximus; here a ciliated protozoon, probably a ——— although it is not recorded in any of the literature that we can find; here we have encysted forms of endameboid bacillus, very rapid, motile form, as particularly this ciliated protozoon. If you will watch it, you will note that it goes through the field sometimes quite rapidly. See this one coming in from below; you note the cilia all the way around the organism. Now if you will feel around your teeth, you can probably feel some of those crawling around. (Laughter.) That is the appearance of an ordinary dirty mouth.

Here we have the organism found in many mouths, with which the viridans has been confused. It has three flagellae and swims in a different form from the viridans; and in a dark field many organisms would be shown that do not show with this illumination.

Here is a dark field showing spirochete forms, some of them very rapidly motile. They may or may not be directly related to our systematic infections, we believe they are related to pyorrheic infections.

This is a study of the normal blood stream, and you will see the erythrocytes or red blood cells passing through the tissues, and later we will inject some bacteria taken from the mouth of a patient who was suffering from dental infection and you will see them as blood clots.

This motion of the frog is caused by the heart beating against the lung, but watch particularly for the movement at the entering of the cell tissue. Here we have the rapidly moving blood in an artery; here, the capillary circulation. There again the capillary circulation is shown very plainly and the large vessels display a spurting motion. There the red blood cells are shown going through the capillaries. Here you have a branching. You see how rapidly that blood is spurting in, how rapidly the blood is passing in through the capillaries. Here again is the capillary circulation; now watch the blood being taken up and going into the veins. This shows it beautifully, going into the veins. Here is an artery, showing that the blood comes almost to a standstill between the heart-beats, but see the capillary circulation in every part of the field. Here is a branching.

Now at about this state we inoculated the frog with two drops injected directly into the heart, into the auricle, of culture taken from the blood stream of a patient. One of Nature's mechanisms is to give us an agglutination of bacteria when they get into blood in which they are not wanted and you will readily see the formation of a clot quite rapidly. This capillary circulation has ceased and a clot is forming in this blood vessel. You will see it break loose if you watch carefully. This is enlarged again. Now watch it moving. It is slowly clotting. Those are masses of bacteria and erythrocytes in the blood vessel. Now watch it break loose. You have seen this clot form before your eyes, and it is the thing that forms in some part of a patient's body when he has a focus of infection inoculating him and producing an embolic clot, an embolic infection in any other tissue of the body.

Now when we look for the capillary circulation, under magnification, it has almost entirely ceased around this thrombus. This shows a high magnification of those blood vessels, and there is almost no motion, and you see here the great masses of bacteria and the frog erythrocytes en masse in the tissue.

Now while I have overdrawn on your patience, and I must apologize for that, I want to emphasize again the need for the new sense, and repeat again that a new truth is a new sense for with a new truth you can perceive things that you cannot perceive without that new truth and which people who are without that new truth cannot perceive. Let us, then, develop the "infection sense." Thank you. (Applause.)

A DEVELOPING PROFESSION—HOW SHALL WE MEET THE OPPORTUNITIES AND RESPONSIBILITIES OF THE NEAR FUTURE?*

BY EDMUND NOYES, D. D. S., CHICAGO, ILL.

The pressure upon the dental profession from the outside, from the public and from the medical professions, has been increasing of late and will be still greater in the future.

The dental care of school children, the publicity given to medical and dental matters in the newspapers, and especially the great awakening of the medical profession to the causative relation of diseases of the teeth and their surrounding tissues to the serious and sometimes fatal diseases in remote parts of the body: all these are causing a continually increasing proportion of the population to realize the need for dental service and to seek for it.

We are sometimes disposed, and justly so, to resent the interference of a few medical men in directing the removal of pulpless teeth without consulting a dentist, or, as happened in a case I heard about recently, telling a patient that some teeth whose roots had been filled a few years previously had been poisoning her system ever since. She came to her dentist and called him down hard for allowing those teeth to poison her for three or four years. There was not the slightest evidence that there was any disease whatever about the roots of them. On the other hand, when we consider what our own men say about the small proportion of roots that are properly filled, we cannot blame the doctors so very much, especially in view of the fact that all doctors I have happened to come in personal contact with in such matters have been ready to give the dentist all the consideration and all the responsibility that belongs to him. This is not the first time the dental profession has been called down about the matter of pulpless teeth.

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*Read before the Chicago Dental Society December 19, 1916.

Somewhere about the year 1885 the New York Medical Record published an article roundly condemning the retention of "dead teeth" in the jaws, and much more recently Dr. Hunter called American dentistry "septic dentistry." In both these cases there was little response on the part of the dental profession except that of resentment. However, since Dr. Rosenow, Dr. Billings and a considerable number of others have scientifically demonstrated the production of such serious diseases as arthritis, endocarditis, stomach ulcers and many other infections from the diseased area about the roots of some pulpless teeth, and since the X-ray has shown so positively the serious imperfection of the larger part of root-canal fillings, there is a real movement spreading in the profession for the improvement of technic in these operations. Let us hope also that along with improved technic, men will study and read enough to acquire a better knowledge of the tissues with which we have to deal, the forms of disease to which these are liable and the methods and limitations of the therapeutic and surgical treatment appropriate for them.

The methods of making pulp canal operations as they should be made have been well and minutely described in a number of excellent papers. These have naturally enough dwelt most elaborately upon the difficult cases, and have had so much to say about working an hour or more over some fine canal and then trying some more at another sitting and have insisted upon from two to four or five X-rays in the course of the proceedings, at the same time requiring such elaborate arrangements for asepsis that I have feared a great many men, practicing for patients in very moderate circumstances, will throw up their hands in despair and say "that practice is not for us" and so be tempeted to shirk their duty and responsibility in the matter and continue on in their same old way. If I can say anything to encourage and stimulate these people I will think the effort worth while.

In the first place, then, nine-tenths of all the teeth except the molars and lower incisors can, if in normal condition, have their pulp canals cleaned out and filled without any serious difficulty and without consuming an unreasonable amount of time and the filling can be carried to the end of the pulp canal, and we can know that it is there and can fill the remainder of the canal without leaving any vacant spaces. It is to be remembered that the pulp canal terminates in the dentin and the passage through the cementum at the end of the root is only a foramen and is usually very small. A broach that will go to the end of the canal will usually stop there and it requires a very fine one to go beyond that and through the foramen. All the cases in normal teeth can be treated and filled without any X-ray at all, an X-ray being necessary in cases of suspected trouble in the apical space. The molars and lower incisors constitute a pretty large class, but a great many of these, probably much more than half, can be managed in the same way as the first class without very much more time and trouble except as the number of root canals is greater in the molars. As for the remainder of really difficult cases, if patients cannot remunerate us properly we should be willing to make considerable sacrifices of our time and skill in the effort to treat them properly, for I hold that we should not accept a patient at all unless we are willing to do the difficult things for them as well as the easy ones.

It is not very readily practicable to maintain in a dental office as complete aseptic conditions as are accomplished in the surgical ward of a hospital where major operations are made. The nearer we can approach to such conditions, within reason, the better, but for root canal work such aseptic measures as are practicable may be adequately supplemented with the use of antiseptics. There is no place that I know of, except for the sterilization of instruments, where antiseptics may be more safely and usefully employed than in the pulp canals of the teeth. That broaches wound with cotton should always be sterilized after winding seems to some of us old fellows an inconvenient requirement, and if proper care is used I do not believe it to be indispensably necessary; the hands should be carefully washed, (I do not mean for fifteen minutes as the surgeons do), and then the fingers and thumbs that will come in contact with the cotton should be well rubbed with alcohol and a drop or two of oil of cloves may afterward be rubbed into the skin. If this is done I believe that cotton may be wound on a broach between the thumb and forefinger without danger of carrying infection, however, it may be still further guarded by touching the end which goes deepest into the canal to any mild antiseptic. It should not be escharotic or irritating enough to destroy living tissue cells or to poison or paralyze them in case any of it should go through the foramen and reach the peridental membrane in the apical space. Oil of cloves will do, or eucalyptol, and "Black's one, two, three" or campho-phenique are pretty safe.

The foregoing relates to pulp canals from which living pulps have been removed, and which will never become infected unless by the criminal carelessness of the dentist. If pulp canals are already infected, containing dead pulps or associated with alveolar abscesses, more effective germicides are necessary.

Personally I do such cleaning as I deem prudent at the first sitting with instruments dipped in formo-cresol, but I have not, for a good while, sealed any appreciable amount of it in a pulp canal for twenty-four hours or more because I fear the possible destructive effects of formalin on the peridental membrane in the apical space. Instead I seal in cotton dipped in oil of cloves or Black's one-two-three with tincture of iodin added. This, I believe, will sterilize a pulp canal in a day or two so that the cleaning of it can be finished in safety. The technic of pulp canal filling described by Dr. Coolidge, Dr. Gethro and others seems to be satisfactory.

I have used, myself, for more than thirty years a different method, which I adopted first in order to avoid the vacant spaces likely to result after a while when a solid cone of gutta percha is thrust into a canal filled with liquid chloro-percha, as was formerly almost universally done and is still common. The chloroform does not stay there very long and there is nothing to take its place except such matters as may come in, chiefly or wholly through the foramen. The technique I have used may be described as follows: After the canal is ready and moistened with eucalyptol as described by Dr. Gethro and others, a plugger is chosen that will go as near to the end of the canal as practicable, a small cone of Hill's stopping is rolled between thumb and finger, attached to the end of the plugger, made plastic as possible over the flame (which probably sterilizes it also) then the plugger is held in the flame, with the Hill's stopping point outside of it so as not to be burned, until the plugger shows red, the point is dipped in eucalyptol and carried as far into the canal as may be, and with a churning motion; this is followed by a Donaldson roughened broach which previous trial has shown will go to the end of the canal, this is dipped in eucalyptol and the small portion of the root filling is churned till it is fully plastic and carried to the end, which can readily be determined by the sense of touch. Subsequent portions of the filling are made plastic by heat and churned in with the hot instrument. In this way the canal is filled with a plastic material that adapts itself to all the inequalities of form, the general proposition being to procure plasticity as much by heat and as little by the solvent as proves practicable in each case. Hill's stopping seems better suited to this manipulation than other forms of gutta-percha compounds, though I have not experimented with the others.

I suppose that a majority of the men who are making imperfect root fillings, badly constructed crowns and bridges and amalgam fillings without a rubber dam, without a matrix, and without finishing at a subsequent sitting are saying, and with great plausibility, that they cannot do better work and live on the fees their patients are willing to pay them. There are of course a few men who are incorrigibly incompetent, but it is my belief that the others could take fifty per cent more time for their operations, charge double their present fees, and if they have any ability of salesmanship their fees would be paid more willingly than at present and their services would be better worth the larger fees than their present operations are for the small fees they are receiving. Certainly a crown that is made over a well filled root and constructed so that the gums and peridental membrane are preserved from irritation and injury is cheaper to any patient at ten to twenty dollars than a crown made for two to five dollars over a half filled root and so badly fitted that the subsequent abscesses or pyorrhea and the possible arthritis, endocarditis or some other serious infection cause a long illness and a big doctor's bill in addition to the loss of the tooth.

The dental profession is getting a black eye from the medical profession and more and more from the public by reason of the men who are willing to lower their standard of skill and thoroughness to meet the competition of cheap prices or the financial necessities of their patients and there are a few men who deserve much more severe condemnation because they are able after a while to increase their fees, sometimes to a very high figure but do not raise the standard of their skill even to the level of their ability. These are the worst of all for they have caused many people to believe that paying large fees does not insure a competent service. Our young men need the heroic spirit that refuses to lower the standard of excellence, in order to make small fees remunerative. Every young man ought to raise his standard and increase the excellence of his operations for at least five years after graduation, by that time he should have mastered the technic of his profession. The value of his professional services ought to continue increasing far beyond that length of time, in fact throughout his whole professional life, by reason of his enlarged experience and ripening judgment.

In the near future the dental profession ought to take up the burden of its responsibility for the care of the poor. The medical profession has long carried such a burden in its own field and we must find a way to do something corresponding in our department.

I shall have little to say about it for I have no plan to propose and my ideas have not become clear. It would seem that the experience of the medical profession ought to be of some use to us though it is not practicable to imitate them closely, at least not at present. If we ever have dental hospitals we may have internes who will serve for just a livelihood, for the advantages of experience in practice, and it is to be hoped that municipalities or school boards may greatly extend the dental service for school children. A few large business houses are trying to provide dental service for their employes. One in particular that I happened to hear about recently, employs four dentists who are paid by the hour for the time they spend in the dental office of the firm. The fees charged are with a view to have the service nearly self-sustaining. Examinations and emergency treatments are free and a small deficit is made up by the firm. This removes any suspicion that the house is running a dental office for profit. The dental school clinics accomplish a similar purpose to a limited extent only. They are largely supplied from the acquaintances of the students, who are encouraged to bring patients, each for his individual clinical practice, and for such patients very little attention is paid to the question of their financial ability. If dental hospitals can be endowed numerously and generously as other hospitals have been, something really worth while might be done. Probably a better plan, and perhaps more easily accomplished, would be for hospitals generally to endow and equip a dental ward with a dental interne on a similar footing as the medical interne, and the dental and medical departments in close co-operation and understanding with each other. In a general way the objects sought should be similar to those of the medical profession; first, the benefit of poor people, and second, to provide ambitious young men an opportunity for a greater amount and variety of practical experience than can ordinarily be had in the beginning of a private practice.

In the near future an advance step will be taken in dental education by extending the dental school course to four years instead of three. This is coming none too soon in view of an awakening recognition of the greater dependence of the dental and medical professions upon each other and the need of a better understanding and a closer co-operation between them than has ever been accomplished in the past. This awakening perception of the urgent need to recognize and treat, and especially to prevent important pathological conditions and changes that occur in the mouth and have direct relation to many and very serious diseases that occur in the field of medical practice, and the causes of which the medical men are beginning to demand that we eliminate from the mouths of our patients, ought to furnish the incentive and point the way to use the extention of our course of study to broaden and strengthen the foundation of the medical sciences that we put under our system of education.

I believe there is some reason to fear that a few schools may use the additional year chiefly to get another year's fees, and a larger amount of clinical practice in their infirmaries. If that were done the additional year would prove of very doubtful professional value. Throughout the whole history of our dental schools the teachers have found the greatest difficulty to induce the students to take any interest in anything except what they call the practical work, and the great majority have shown no care about chemistry, anatomy, physiology, histology and pathology except to somehow pass the examinations and get by the state boards, and the dental profession is largely if not chiefly responsible for this attitude on the part of the students. I suppose that most of you sold to under class men all of your text books except those on operative and prosthetic dentistry, and possibly therapeutics, and the attitude of mind indicated by that has been conveyed unconsciously, and often intentionally to such young men as have talked with you about a dental education.

There has been a strange and very unfortunate misplacement of values in estimating the different parts of a dental college education. It is indispensable of course that adequate instruction be given in all the technical procedures of the profession and there should be enough practice to fix them in mind, but neither great skill or rapidity are important. The men will be doing those things every day after they get out of school if they have any practice, and skill and speed will be perfected. They will not have the same incentive or opportunity to continually review their anatomy, histology, etc., and if they do not study them thoroughly enough in school to make them a permanent possession they will not have interest enough nor a sufficient foundation of knowledge to enable them to keep up with the future progress of the profession.

We shall not have an ideal dental education till we make our entrance requirements the same in our best schools as in the best medical schools, and our foundation in the fundamental medical sciences as broad and thorough as it is in them. When that is accomplished the members of the two professions will have the same broad foundation of scientific knowledge upon which they can meet on terms of real equality.

THE CORRECT WAY TO DETERMINE YOUR NET INCOME.*

BY DR. W. J. HOLROYD, PITTSBURGH, PA.

Mr. President, Members and Guests:

I have a message for you: During my lectures in different parts of the country, I find by personal observation and inquiry that there is a wave of feeling against the present day methods of practicing dentistry viewed from a business standpoint—a bitter complaining that more help was not given to the student in dental college and a regret that something definite and practical has not been done along these lines by the societies at large for the graduate student.

You know, I know, we all know that a young man takes up dentistry to better his financial and social condition; if he feels that he could not do that, he would not have quit his former vocation, because human nature tends to an upward development instead of downward. Therefore, there is nothing philanthropical in his initial motive when he thinks of taking up dentistry, but when he gets fairly launched in it, he finds he is hidebound by conditions which from the standpoint of getting a living are not based upon common sense.

His teachings—as you all know—are that the money end of things will take care of themselves—that prices are self-adjusting—he is imbued with the idea that he is above money—that his title of D. D. S. makes him and puts him above the sordid thinking of money, and if he dares to ask about the relative prices of operations he would be and he is waved to one side. This is a decidedly wrong attitude to turn a young man out into the world with.

This request has been made quite a number of times that I cover this subject in one article. This is a difficult thing to do as it really should be spread over a course of lectures, entailing concentration and night study, but I will endeavor to call the essential facts and present them to you on a working basis. But, in order that you will appreciate the importance of this subject more, we will together, from a bird's-eye view, so to speak, find exactly what position we occupy in the business world, how we are regarded by the outside people (who are the true court and give us our relative standing in the community, no matter what we think of ourselves) and I want you to keep this neutral viewpoint in mind, for a short time, while we analyze ourselves. This will put you in a receptive frame of mind for what is coming later.

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*Read before the Wisconsin State Dental Society, 1916.

It is a good thing at least once a year for every dentist to adopt this policy and stand aside and look at his place of business and his methods as if it belonged to some one else, and pick out the things this fellow has left undone. By sticking to yourself and being too close to your work, sometimes narrows a man's vision and makes him overlook important things. You can do and practice a wrong thing or method, day after day, and think it right because of constant repetition, but to get this unbiased judgment as if you were some other person, will help you out wonderfully, to rectify these matters. If your keep to yourself you suffer a mental block. Don't think the longer you have been a dentist the better you are. We are now on the outside looking in—examining ourselves from outsiders' standpoint.

We find, by contrast and comparison, many good and sufficient reasons why we should study business methods more closely.

Looking about us on the outside business world, we find a progress almost appalling, passing us dentists by, as if we were standing still. The tremendous buildings going up, the enlargement of stores and plants, the enormous amount of initiative and executive ability that it requires to see these things through, and we note special training methods for men who have to handle these things. A balancing of education, so these men can direct matters properly with a full consideration and understanding of the proper proportions of production and salesmanship.

We see schools of all kinds, giving you the proper training in their vocations, and on the other hand, schools of salesmanship and business direction by the score at every turn. Noon luncheons and talks along these lines which are helpful, and show the signs of the times. Life is becoming more complex and a man has to know all these things 12 years sooner than our fathers knew them. Our fathers got experience by hard knocks and gloated over them, but the price paid for some of this experience was too high and sometimes resulted in the death of the individual.

Now the new way is to accumulate the experience of others and mass it together and hand it in the concrete to the student to apply, eliminating the pitfalls, and by statistics reducing the liability of failures to a minimum.

This is a big help to a young man of today and has been done in almost every vocation but dentistry. (Remember now we are speaking from a business standpoint.)

Our business policy has been a joke for 75 years and in the face of marching events it behooves us to consider, solve and remedy these conditions in our own practices. It is only too bad that some of this work was not done by our forbears in dentistry. It makes it doubly hard for the ones doing the work now, as they have to combat precedence, foolish ideas, a standing pat on the old methods of doing things, a hypocritical conception of applied ethics and many other things, which block the wheels of progress.

I will here outline some of the reasons why we should be quick and get down and study this subject:

In the first place from insurance companies' standpoint we are regarded only as a second class risk. On account of working over people, with all kinds of diseases they contend that our liability of contagion and infection is heightened, which is true. Therefore, our death rate is somewhat higher than other vocations and as a rule we do not live as long.

Our profession is purely personal—when we stop, everything stops. We cannot have a corps of clerks to carry on our business—even to make expenses, and should we get ill, our office is non-productive for the time being and in addition to that expenses going on and nothing coming in.

Our inability to handle the assistant problem successfully is another significant reason.

Our family cannot sell out a so-called established business when we die. All that can be sold is our outfit at 25% to 33% of its value. There is no such thing in our profession in America as "good will." Such is the fact in Europe, but not in America. I'm speaking now in general, not the exception.

We have no wholesale dealers to help us determine our correct prices for different kinds of work. Druggists, haberdashers, hardware, cigar dealers, have determined for them, by the manufacturers, the set prices of their respective goods to the trade. That is a considerable help, because it at least establishes a minimum. Our prices are determined by the public mostly. They tell us what they want to pay. We grab what they give us and let it go at that, because we don't know how to apply our overhead expenses on to the finished operations, and until we know this we will continue to let the public pay us what they choose.

No successful manufacturer allows his patrons to do this. Don't let the public be your boss.

Every manufacturer places his price scientifically and the public pays, and he knows enough to let them walk out, if they won't pay him a profit.

The dentist works *under* cost sometimes and *doesn't* know it. The manufacturer *knows* when he is selling at a loss.

Don't sell your time at a reduced price—ask full price for it. You are not conducting a dispensary. It is unfair to yourself and family and there is no necessity.

Make your patient pay your *overhead* and then pay you a profit. You and your wife have to do it with the articles you buy from the other fellow. The public will not pay unless you ask them. You won't pay the shoe dealer $6 if he only asks you $4. Make the public pay you your profit in your vocation. But this must be done fairly and scientifically.

Another reason why we should study this phase of the profession is that we are not helped in college one iota. The student's former vocation, before he took up dentistry, did not trend along cost keeping lines or assuming the responsibility of business (that was generally assumed by older heads). They had absolutely no training along those lines and are turned out on the world to work out their own salvation. The result is dissatisfaction, wrong points of view, wrong interpretation of ethics, reverting to other callings and chaos in general, which could be avoided if the proper understanding of applying overhead and the right way of determining our *net* income was understood. All this trouble and dissatisfaction is brought about by this subject not being taught in the colleges.

I have been criticised by taking this standpoint, with regard to the taking up of business courses by the colleges, but on the other hand, I have received numberless letters upholding me in my attitude.

But I see the handwriting on the wall and I know it will come —it has to come, and the college which adopts it first will have the advantage over all the other colleges—everything else being equal.

We pay a price for everything we get, directly or indirectly, but the price the dentist pays for this business knowledge is too great. A class of 50 men will lose $50,000 in 10 years, in not knowing how to collect and will lose $100,000 in 10 years by not charging a living fee for their work. It takes from 8 to 10 years for them to wake up, and those years are too precious to lose. They constitute a large slice of the dentist's working years, but it is never too late to mend and until the colleges cover the subject we have to depend upon the study clubs and the help from the manufacturers, who are now entering the field. And the dentist who gets down to these rock bottom fundamentals of business the quicker is he going to win out and have a compensation for old age. I cannot make this too emphatic.

The dentist after graduation is content to sit back on the job satisfied with the bare fact that he has gotten through, whereas if he viewed the conditions in their true light, he would realize that things were only just starting. He lacks the spur of the overhead boss, who, if his force do not get results, discharges the individual offender.

The average dentist closes his books gladly, sits down for what he thinks is a well earned rest, and conducts his livelihood in a sloppy, slipshod way, which is the laughing stock of all men in other lines of endeavor.

This is all the more *non*-excusable for the fact that dentists have demonstrated that they are capable of this effort, a fact just shown by their having gone through college and are supposed to be now educated men. But as a mass they are content to rest on precedent on old sayings and doings, which are out of date and do not fit in with the present scheme of things.

Any man who does not realize that fact, after reading and coming in contact with the present doings of the world, must not be surprised if he is left hopelessly behind. Every walk of life perishes, if it is not conducted on this new system of things. And to sit back in so-called superiority (when for a fact the average dentist has not an extra dollar in the world) demonstrates nothing except hypocrisy.

Credit men regard us as bad risks and some office buildings do not want us as tenants.

There are three ways of conducting a business:

1st: Using too much business to push a bad article.

2nd: Using too little business to push a good article.

3rd: Spending 50% time on business and 50% time in producing a good article, in short a 50-50 policy—which is the safest and sanest and the only kind of a policy that wins out in the long run.

I would advocate a more perfect balancing of the two phases of our profession and the benefits would be more far reaching for both the public and the dentists.

A man who takes up any vocation for a livelihood should study the business end of it. He is foolish and not fair to himself and family if he does not. Any man who assumes payment of bills, money responsibilities and protection of family, is not upright with himself and the world if he does not study the business phase of his vocation.

It is time that something should be done and something definite applied when a man quits a former vocation—studies dentistry three years—and then at the end of ten years can only make $1,250 net out of his practice—which is the average.

Although there are a hundred more reasons, I think the one above sufficient why we should study and continue to study (as conditions year by year change) the business side of dentistry.

We will now enter upon the subject matter and take for instance a dentist who wants to earn $2,500 a year net.

I will make it as simple and clear as possible and speak mainly in even figures so as to make it more easily understood.

The dentist naturally asks: "What shall I do first—how shall I go about it?" First get your yearly expenses or "Overhead," as the cost experts call it. Overhead is any expense that is caused by your being a dentist. If in doubt as to whether you can charge any given expense against your practice, ask yourself "Would I do it if I were not a dentist?" You can then tell whether you can legitimately put it down as expense against the business.

It must be said in favor of dentists, therefore, that they have been paying out of their own pockets expenses that should honestly go against the practice. Fooling themselves as to their net income or earnings.

I will now refer you to the sample expense sheet or overhead expense.

I have gotten together all the descriptions of expense I have seen published and have spent a lot of time getting them under eleven separate heads, in a comprehensive manner. The reason I have gone so much into detail is to emphasize and drive in the importance of the fact that there are so many channels of expense. All those items have to be paid before there is anything left for you. The sub-heads are self-explanatory, and if followed out will give any dentist a quick idea of where his money is going. I have never seen a group of expenses gotten together under sub-heads, in detail before. Any improvements will be gladly accepted. A dozen or more men can get together and each have a book printed. The information you will get from it is well worth it. It will show the "leaks."

Second—Put down your desired salary—say $2,500.

Third—Now take stock of your office. Estimate what it cost you to equip your place of business:

Operative equipment.
Laboratory.
Furnishings.
Instruments, etc., etc.
Partition.
Plumbing, etc.

Say this cost you $1,750—you must take off 10% yearly for depreciation as follows: $175.

Cost of education, $3,000.

The two above items, viz.,

Education	$3,000
Equipment	1,750
	$4,750

constitute your stock in trade and really means so much goods on the shelves, so to speak, and you must charge 6% per annum on this investment, viz., $285.00.

Fourth: This fourth point must be carefully explained. If a merchant has $3,000 worth of goods, he charges against the goods 6% per annum, but he can also get his $3,000 back in cash when he sells his stock. We dentists can only get our $3,000 worth of education back in installments—say 4% per year or $120 each year for twenty-five years in practice. Charging to our expenses $120 a year for 25 years makes $3,000 the point where we get the price of our goods back, so to speak. This makes another item of expense: $120.

Understand, this last item $120 is distinct and separate from the 6% item, $285 is the interest on your investment and the other getting your goods back by yearly installments—$120 each year.

Read this over until you understand it thoroughly.

Compiling the above data so far gives us a table of:

Yearly salary	$2,500
Yearly expenses	2,000
10% depreciation on equipment	175
6% interest on investment	285
4% reimbursement	120
This bring the total expenses for the year	$5,080

Next: Get your actual productive hours per year. Not your total hours in the office, but the actual hours that you can charge for.

There is a tremendous leak here. Much more than the average dentist dreams of. The dentists as a body have not figured this out and only a few here and there have gone to the trouble. The writer has kept account for three years and compared results with Dr. Clapp of New York, who has done considerable investigation in this matter, and the consensus of opinion of these men who have done this compiling is that 1,000 hours actual productive time is correct, for the mass of dentists. Here and there you will find a man of strong constitution who will work longer, disagree with these figures, but he is the exception and not the rule, and we cannot make an argument of an exception.

In these articles the spirit is to take the subject en masse. If any man is skeptical do not let him say any figures are not so until he has investigated and not guessed and in a simple way to decide these 1,000-hour figures for himself, is for him to keep his day book in two columns—first column productive time, the second column non-productive time. Let him keep this book thoroughly for at least a year and then we will entertain his arguments. Tell him he must accept the figures of the men who have kept these statistics.

I have done my best to cover this subject of actual productive hours in a separate article, published in the *Dental Digest*. So we will not go into the subject further in this lecture.

Accepting then 1,000 hours for the working out of this present problem, we now divide the total expense $5,080 by the productive hours viz. 1,000 giving $5.00 per hour.

What next? We have now to time our different operations, and to get about ten average times of each operation to give a fair estimate on that operation. For instance twenty amalgam fillings gave an average of thirty minutes, which at $5.00 per hour, would cost $2.50 per filling, if we wish to make $2,500 per year, according to the figures in our above problem.

The trouble that I encountered at this stage of the investigation was that there were no charts on the market that I could accomplish this timing and at the same time keep track of all my work at one entry.

I will now refer you to the special ledger sheet and timing sheet combined. It takes care of all your work and at the same time, when you get through it gives you information about each separate operation. Most other charts give the time of all your work in a lump and do not provide space enough to write things down.

This ledger chart combined with the little yellow laboratory time chart, gives you all the time information necessary. If you will only be fair to yourself and put your time down—put your laboratory time down also on the ledger sheet—get it from the yellow slip. Any ordinary mechanic has to do that for his timekeeper to make up his wage and if he can do it so can you. Remember every sitting is a sale. The same as if you sold a shirt or a pair of shoes and you should put the time of every sitting down.

After you once get the habit—it's no trouble. The price of every commodity is based upon time. You are paying on that basis every day for everything you buy. If you do not know how much time it takes to do any operation from your averages, you cannot give estimates intelligently and you are only guessing.

From this point you can take the results from the ledger charts and fill in the sheet I have designed for the averages, at the back of your book. After a while you will have quite a few "times" to take your average from.

It is handier to keep the records in pencil, and from this point on you will begin to see light.

You can gradually fill out the different operations automatically, because it will practically be done at one entry and you cannot get away from that. Then you will see unfold information which you have required for years and never got. You will not need anyone to ask you to raise prices, you will do it yourself. Estimate every piece of work, as if you did it yourself. You will have to do a few pieces of work of every kind yourself so as to get the right basis.

I cannot make you do these things. I can only point out wherein before you have been wrong, and it is up to you whether you want to improve it or not. Everything has been done for you except your own timing and no one can do that but yourself. A great deal of time and expense has been gone to to get these charts together to help you out and any man who doesn't follow these principles is on the wrong track. Any cost expert will tell you that.

There is nothing new in the principles laid down, for they have been practiced from time immemorial by successful business men.

The dental profession as a whole has been resting back in sunny complacency with regard to their business campaign. Satisfied to muddle through somehow, come a day, go a day sort of existence, the exact antithesis of what is demanded by business. I have opportunity of watching the way some business clubs work, the way they marshal their forces and I am decidedly impressed by the way they make things move in a short time by the efficient manner in which they get results.

The idea in this article is to stimulate interest and not prejudice. To know where you are heading—to follow some definite policy. Isn't that better than the old haphazard way? To have men look up to us as a successful profession, then we can get the best brains into it. We are only the keepers of those who come after us. Make yourself into a committee of one and start this campaign for your own satisfaction. It will take you a year to find out where you are at, and if you let it lag, you'll be dead before you get the benefits.

You have been held so far by the tyranny of environment and precedent and you want to be strong enough to burst its bonds. That's the truth and we must face it, and there is not much to men who are not wiser today than yesterday and it is surely axiomatic that to earn something you have to learn something. The fact that we have been going on the wrong track for years does not say that this generation is going to continue so—far from it.

For 75 years the profession has not studied the business end of dentistry scientifically and to broach this subject at all is like butting a stone wall. We have precedent and environment to deal with and they are awful barriers. Lawyers will tell you that.

We have to convince men who have been doing things for so long that they are ossified and are very hard to move, as the old Scot says. They are very set in their ways and there is still a trace of the old witch time left, that any one who suggests new improvements is stoned. The mental receptive attitude of a dentist is a big factor, before these different problems can be settled. A business man would jump at the enlightenment, but a dentist, not.

Failures, as described by Dun and Bradstreet, are mainly due to two things, lack of capital and mismanagement. What is mismanagement but ignorance? If a man is not ignorant, he will hardly mismanage. To know where you are losing money and where you are making it is good management and only keeping everlastingly at these problems will bring success.

The trouble is that anything that requires much mental effort never becomes popular. But any man who devotes time to these problems will see a surprising difference in his pocketbook. That is the law of compensation.

Remember, titles are but empty names and don't get you anything unless you apply business principles. No one is going to hand you any money because you are a D. D. S. When you give away service below cost it is easy to get patients, and when they are so dead anxious to buy then is a good time to find out what you are giving them. Any one can be busy. The main thing though is—are you saving any money.

There seems to be a prevalent feeling that the less a man attends to business the better dentist he is. Not so. A dentist has a better opportunity to become a better dentist if he attends to his collections. Knowing his estimates and how to put things on a paying basis. Then he does not have to work nights, Sundays and holidays and has money for post graduate work and conventions.

Why there is still an element remaining of this class of men who have enough influence to hold things back is only regrettable, because in time they will have to give way in the progress of things. None of their arguments hold water. A dentist is not a better dentist because he does not keep books. If he does keep books that does not say that he is less of a humanitarian. In fact the probabilities are that he is a better dentist and in a much better position to give charity judiciously, if he handles his practice in a business-like manner.

It is regrettable that any opposition for the betterment of conditions for the dentists should come from so-called educated body of men, whereas in the olden times it was blamed on the condition of the uneducated masses. We read with derision of these conditions existing when we read history, but these conditions still are here, but it does not stop the going ahead of the enlightened few. And in closing I may say that expenses have gone ahead of compensation and it is up to us to remedy things as soon as possible in an intelligent manner.

ETHICS AND ECONOMICS.
PROFESSIONAL MORALITY AND PROFESSIONAL BUSINESS.

BY EDMUND NOYES, D. D. S., CHICAGO, ILL.

The writer of this attended on February 14th and 15th the annual meeting of the Alumni Association of Marquette University Dental Department, in Milwaukee. It was a very large meeting and there were four excellent addresses besides the speeches at the banquet. Dr. Arthur E. Smith of Chicago gave an exhaustive account of nerve blocking anesthesia, profusely illustrated by the lantern and moving picture films, and Dr. Albert W. Jarman of Philadelphia an illustrated paper on removable bridge-work.

Major G. E. Meyer of Chicago gave a most interesting account Wednesday evening, with a great number of lantern slides, of his work and experiences as oral surgeon in one of the hospitals in France.

Dr. Geo. Wood Clapp, editor of the *Dental Digest,* talked for two hours Wednesday afternoon on "Professional Denture Service" and again equally long Thursday afternoon on "The Interdependence of Ethics and Economics." At the banquet Dr. E. C. Kirk, editor of the *Dental Cosmos,* made the principal address, followed by Pres. Noonan of Marquette University, Dr. Gallie, Dr. Goslee and several others.

Being in the midst of my lecture course on professional ethics I particularly desired to hear Dr. Clapp on Thursday afternoon. It is well known that ever since the publication of "Brother Bill's Letters" eight or nine years ago Dr. Clapp has carried a department in the *Dental Digest* on business building, or the economics of dental practice; and many of our best men have feared the tendency of this campaign to commercialize the profession, and regretted the seeming confusion of ideas about the differences between a business and a profession, as well as the apparent ignoring of the fact that professional men are expected to assume certain moral duties and obligations not required in the same manner and extent from business men.

Dr. Clapp in his lecture made some theoretical statements, and disclosed a point of view and an estimation of relative values to which very serious objections must be taken, but the practical advice he gave to the great audience, mostly young men, was most excellent, and it is to be hoped many of them will greatly profit by it.

The advance synopsis of his lecture begins in this way, "The purpose of this lecture is to show that ethics are necessarily based on underlying economics, and that if the economics are not sound ethics cannot be honest in practice whatever they may be in profession."

This statement is topsy-turvy. Economics should be founded on morality and not morality on economics. (It should be said perhaps, that the words morality and ethics are as close synonyms as can be found in the English language, they may be used interchangeably.)

There is nothing in human life and conduct except religion that is more fundamental than morality, and economics that does not find its foundations, its authority, sometimes its limitations, in the principles of morality is not sound economics, whether it be the economics of a professional man, a business man, a manufacturer, a farmer, a mechanic, or an unskilled laborer. When this has been said it should also be affirmed that morality and economics are not antagonistic but mutual and coöperative, and should lock arms and keep step for mutual support, steadiness and efficiency.

A similar objection must be taken to Dr. Clapp's statement of order of precedence or importance to be given to the various parties whose welfare is affected by a dental practice. Dr. Clapp enumerated five interests concerned, and he gave preference first to the dentist, second the dentist's wife, third his children, fourth his patient, fifth the neighbor dentist. This statement of relative values or interests seems to me to ignore the professional character of a dental practice in a very important respect. The relation of the dentist and his patient is in the nature of a trust and in undertaking that trust the professional man assumes the duty to make the welfare of his patient the first consideration in whatever he does for him. Perhaps this can be made clearer by illustration. Men in other callings sometimes assume trusts. Suppose a man takes a thousand dollars to one whose business it is to place investments for people and intrusts it to him saying he wants a safe investment from which he can be sure to receive the income regularly and the principal when due, and suppose the man knowingly makes a bad or uncertain investment by which the principal is lost, and does it because he can get one hundred dollars commission, instead of fifty dollars commission for making a safe investment. You would say that he betrayed his trust in giving his own interest the preference over that of his client. Suppose a patient comes to a dentist and he looks the case over and decides to do, not what will best promote the patient's welfare but what he can do the easiest and for which he can persuade the patient to pay the most money. He also betrays his trust by making his own interest take precedence of the welfare of his patient.

These theoretical statements of relative values; that morality is more important than economics, and that in the practice of dentistry the welfare of the patient should be the first consideration do not imply that morality has any quarrel with economics and good business management in the conduct of a practice or the management of personal and family affairs. Nor does making the good of the patient the first consideration imply that the welfare of the dentist, his family, or the neighbor dentist be in any way neglected.

Dr. Clapp enumerates what the patient has a right to expect from the dentist, "Extensive and intensive knowledge; good technical skill; adequate equipment."

"An unhurried and unworried mind."

"Service that is economical to the patient."

"A knowledge of what service will cost."

In explaining how a dentist is to come to his patient with an unhurried and unworried mind he said it should be by "Invisible, intelligent, extensive and smooth running organization," and in this he included, besides the management of the details of practice, such a standard of fees and such a relation between income and expenses that he may come to his patient with a free mind, not having such things rising up from his sub-conscious mind as how he is going to meet the overdue bills of "the butcher, the baker and electric light maker," and whether the fees he can get from this patient will be enough to help him out, but able to give his whole attention to his patient without distraction, with a view to make the best diagnosis and render the very best service that he is capable of giving.

You will see that this amounts to just about the same thing as giving the welfare of the patient the first consideration. In such advice as this, and in urging that a man determine in his own mind how much income he is fairly entitled to receive and telling young men how to go about it to get it I believe a real service has been done.

There is a serious danger attending it also. The basis announced for the fixing of fees has been the time required for operations, and the "office hours and income hours" in a year are the only factors about which much has been said. There is no doubt that in a dental practice the time required to make operations is the most important single element in estimating the fees. We may possibly concede that for many men it is as important as all other considerations, but there are always other things to consider, the skill, judgment, experience and reputation of the dentist, the importance and usefulness of the service, the difficulty or risk attending it, the financial ability of the patient, and probably a number of other matters. It is very well and quite desirable for the dentist himself to know what his average hourly income needs to be, but the less our patients hear about charging by the hour the better it will be for them and for the profession. If it becomes a universal practice and generally known that we are all working by the hour nothing can prevent our loss of professional standing. We would become skilled artisans working for wages instead of professional men serving our patients for professional fees.

There was printed on the last page of the program in Milwaukee a poem entitled "Dad's Ethics"; this was copied from the

Dental Digest, where it is published with the unqualified approval of its editor. It is as follows:

DAD'S ETHICS.

BY MIRIAM TEICHNER, NEW YORK.

This little poem tells in terms of almost scientific accuracy the history of a dentist who refused to found his ethics on economics, and of the family he left behind.—Editor.

His mind was a warehouse, all splendidly stored
With ethics.
But business—ah, that was the thing he abhorred!
He liked ethics.
He was just a bit backward in asking his pay,
Or charging for work that had eaten away
His time and his profits, because, he would say,
'T isn't ethics.
Peculiarly blind he remained to the end,
With his ethics,
That business-like, up-to-date methods might blend
With ethics.
He feared economics as though they would bite
And he slaved and he labored from morning to night,
Content that his pay was his will to do right,
And his ethics.
Till one day he died, still determined that he
And ethics
Had nothing in common with dollars. Now see
How ethics
Without economics can bring about woe:
His widow was left with four children, you know.
And they haven't a cent, nor a place they can go
On Dad's ethics.

It is astonishing to me how any man of professional character or ideals could give such a thing his indorsement. Its evident purpose is to discredit our professional codes of ethics. I have noticed before now that when men set out to cast slurs upon our ethical standards they usually first set up a man of straw and when they have knocked it down they think they have delivered a body blow upon the code of ethics. Of course none of "Dad's" mistakes or misfortunes were in any wise made necessary by any of the accepted standards of professional morality. If his ethics had anything at all to do with his misfortunes it was because it was not broad enough and did not make suitable account of the duties his patients owed to himself or of his own duties to his family. But why charge what happened to him to his ethics when there are nine chances in ten it was wholly due to other causes? There are plenty of guesses more plausible than his ethics by which to account for his fate. He may have been professionally inadequate in some way or other, a great many men are. He may have lacked a pleasing personality, or the ability of profitable salesmanship of his services. He may have spent money foolishly or invested it unwisely. He appears to have neglected to carry insurance as he should have done for the benefit of his family. He may have spent his income for the education of his children and to give his family the largest and best and healthiest life he could procure for them. In that case if he lived to near the "pension age" (which Dr. Clapp says averages about sixty-five years), his children were grown and able and willing to take care of their mother.

It is deplorable that any man should think it necessary to discredit or cast slurs upon the principles and rules for professional conduct long established and agreed upon by the medical and dental professions in behalf of a campaign for better business methods in the conduct of practice, a better quality of service and larger remuneration than have been common with large numbers, probably a large majority of our profession. The codes of ethics, and the best standards of professional morality have nothing in them antagonistic, on the contrary they have much that is helpful to the most successful business methods and the largest remuneration to which the members of our profession are fairly entitled.

PROCEEDING OF SOCIETIES.

SIXTIETH ANNIVERSARY MEETING, ST. LOUIS DENTAL SOCIETY.

Held at the Planters Hotel, November 16, 17, 18, 1916.

THURSDAY MORNING, NOVEMBER 16TH.

The meeting was called to order at 10:00 a. m. by President Virgil Loeb.

A paper on "Exodontia" was read by Dr. Carl Lucas, of Indianapolis.

[This paper has already appeared in print, and thus cannot be reproduced in the DENTAL REVIEW, it being an invariable rule of this journal not to publish matter which has been printed. To make clear the discussion a synopsis is herewith given of Dr. Lucas's technic. In impacted lower third molars he advocates the method introduced by Dr. Chalmers J. Lyons of using a mallet and chisel for removing the plate of bone over the impacted tooth instead of burring it away with the engine. This technic is described in detail, and its advantages pointed out. In ordinary extractions preparatory to placing artificial dentures, Dr. Lucas advises trimming away the sharp spiculae of alveolar process after the teeth are removed and smoothing the ridge of bone down quite even and then suturing the flaps of gum together so it will heel more quickly. He claims that in six days after extraction by this method an impression may be taken and the denture inserted with the very best results.]

In concluding, Dr. Lucas said:

This model was made from an impression taken four days after the teeth were extracted. The sutures were removed on the fourth day in the morning, and in the afternoon the impression was made. I would be glad to have you look at this model more closely, if you wish to, and I will pass it around. This second model, of the same jaw, was made six days after extraction. I would like you to look at these models and see what you think of the result by following this technic.

I made the assertion in the paper that a permanent denture could be constructed within from four to six days after the extraction of the teeth and that the alveolar process, instead of resorbing, after this operation would be built up. To prove that assertion, I have a number of X-ray pictures of the jaws, of dentures which I have made over a year ago by this technic. These radiographic pictures show that the alveolar process is not resorbed, but that it is built up to smooth, rounded proportions, as I have stated in the paper.

Dr. Loeb gave me to understand that there was to be no discussion upon any of the papers. I consider that this technic is a little radical, and I have asked him if he will call upon Dr. Winter for his opinion, offhand, of what I have tried to present today. I thank you all very much for your attention.

Dr. George B. Winter, St. Louis:

Mr. President, Members of the St. Louis Dental Society, and Guests: I am sure we have been very fortunate in the able essay on "Exodontia" by Dr. Carl Lucas. I believe, as Dr. Lucas has stated to you, that we must come to better surgical procedures in our exodontia. This paper is one of the few papers that has ever been presented before any dental society in the country, or, in fact, in the world on scientific exodontia. It has been a sadly neglected subject of dentistry, although it is one of the most important in view of the many infections that are commonly associated with the removal of the teeth. This association of infection with extracted teeth has been due, I believe, very greatly to the amount of trauma resulting from improper technic.

I am not in accord with all of the technic of Dr. Lyons, as outlined by Dr. Carl Lucas. Dr. Lyons is my personal friend, and I have the greatest admiration for his ability. He has done a wonderful amount of good work. But there are certain cases, in which the trauma produced by the mallet is too great. We should endeavor to remove the teeth with the least possible amount of trauma. We know that in many instances it is a matter of guesswork with the chisel and also with the burr. However, I believe that Dr. Lyons is getting closer and closer each day to the solution of the problem of removing impacted third molars. It is thoroughly a surgical procedure; and where infection is established and where the operation is going to take some time, it should be done in a hospital. Every time that I have operated on a difficult impacted third molar in my office, almost every time I have got into trouble, and it is our duty to our patient to see that the operation is carried out properly. The basic principle, however, of the entire operative procedure of impacted lower third molars is based on the diagnosis preceding the operation. A classification of the lower third molars when impacted may approximately be divided into about seventy classes, so that the technic of chiseling, as described in one case, will be impractical in another.

These slides have been gathered together in a few minutes' time. We have been disappointed in Dr. Price not being able to be here this morning, and I have very hastily gathered a few slides together in relation to the subject matter of Dr. Carl Lucas's paper.

The first point is the second molar, its relation to the third molar. Here we have an instance of the second molar destroyed by the pressure of the third molar.

Here is another complete impaction, in which you will observe the distal root of the second molar destroyed by the pressure of the third.

This is a reverse to normal, and shows how the radiograph may deceive us. At this point here were have the outline of the alveolus. This was made by one radiographer in this city, and the next illustration shows the same tooth radiographed by another operator, but with the alveolar outline at this other point, showing that the radiograph is not always dependable.

This is another condition of the same kind, with the tooth lying in a horizontal position and the third molar erupting toward the cheek.

A large odontoma located over a lower third molar.

The odontoma over the third molar.

The odontoma removed, except a very small portion at this point which was removed at a later date.

An absolute reverse to normal.

Seventy-five per cent of the roots of the third molars in normal alignment are distally inclined. The roots vary from slight to marked distal inclination, and the remaining per cent are straight. That is, with the complete impaction we have 75 per cent straight and the remainder distally inclined.

Here we have the impaction caused by the gum tissue over the distal or occlusal surface. Here we find a muscular fiber which, even though it is lanced, gives very little relief, and the importance of radiographing in these cases cannot be too much insisted on. It should be done in almost every case of partial impaction, owing to the fact that you have a rarefied area distal to the third molar which needs a thorough curettement. That condition is very common in these third molars.

Here is quite an extensive area. You see the root formation is practically straight in a large percentage of these cases.

Here is your area again, and the roots, of course, straight.

Now this brings us to the next form of impaction, where the impaction is due to the alveolus over the distal surface. This is a partial impaction, and the alveous comes over the distal surface of the lower third molar, interfering with its eruption, and will also interfere with its removal at this point here. Dr. Lyons' technic is a beautiful technic in that particular case. Here is another that shows that condition.

This shows it very markedly. You see your alignment there, your area there, and your roots are straight again.

Here is your alignment once more, and your necrotic area.

This shows it very marked. Any attempt to remove the tooth without removal of the alveolus to the distal would spell disaster.

This brings us to another classification. Here is the border and the root formation. You see you are starting to get a distal inclination, and this marked distal inclination of the entire tooth is very common where you have a complete impaction caused by the alveolus. Here is your alveolar line. Now it is almost an impossibility to follow the root formation or the crown formation with a forceps in cases of this character.

Here we have the entire tooth distally inclined.

Here is your border again. It is all under a partial impaction.

Another form of partial impaction, where the alveolus is interfering on the distal surface of the third molar; a partial impaction with the root straight and a marked division of the roots of the third molar.

Here we come to another class of cases, in which we have a slight impingement of the crown of the third molar upon that of the second. We have the interference of the alveolus to the distal and the interference of the impingement.

Another slight impingement with an interference to distal of the alveolus. It is a slight impingement upon the second molar.

You will note the almost entire absence of the distal inclination of the root of the lower third molar when impacted; here we have again impingement at both points.

This belongs to the same classification.

The same classification. We can put them, almost, into a definite class and then follow a definite technic.

Here we have our contact; also here we are coming to a more complete impaction, the contact being at the neck of the tooth instead of at the crown of the tooth. Then, too, the contact is a very light one, not a contact that will interfere markedly with the delivery of the tooth.

This is a more marked contact.

A still greater contact and a greater amount of alveolus to the distal. Now we are coming to the marked distal inclination of the entire crown of the tooth, root formation and all, and you see your alveolus at this point and your entire tooth directing toward the distal. In that case, Dr. Lucas, it is impossible to get your chisel here to do any effective work at all except at this one point.

This shows a more marked contact. The former contact was rather light at the neck of the tooth. This is more marked and there is destruction of the alveolus to the distal again.

More marked contact, straight root, and a very long, heavy root.

A separation of the root and a more marked contact.

Still heavier contact, destruction of quite an amount of alveolus, and a marked separation of the roots.

A heavy contact, a marked separation of the roots, and a large crown.

The contact is very low here and the alveolus exceedingly heavy.

A very heavy contact again, and in this an exceedingly heavy one. Here again a lighter one.

Now what may result from the removal of a tooth of this character by attempted operation with a forceps? Where we have the alveolus over the distal surface, an attempt at removal by a forceps operation produces a fracture of the mandible, this showing the fracture very plainly.

Another case where many attempts have been made to remove a third molar distally inclined, with the alveolus interfering to the distal. A forceps operation was attempted here, and all the success resulting was fracturing away the enamel at this point.

Another marked distal inclination, showing close relation of inferior dentinal canal, which is quite a factor in the removal of teeth when impacted.

Now we assume a more horizontal position, starting in with very light contact, a light amount of alveolus to the distal, tooth almost in line with the second molar.

Again a very light contact and a light amount of alveolus to the distal.

A little heavier contact, but not the close contact, and a like amount of alveolus to the distal.

The contact is closing up more and the amount of alveolus over the distal is increasing. This case comes under the classification of complete impactions and the cases Dr. Carl Lucas referred to that should be operated on in a hospital.

Gradually increasing alveolus at this border.

Now we are increasing our contact with the second molar, taking the distal surface of the second molar and part of the distal root of the second molar; in addition, a dense amount of alveolus to the distal.

Increasing the contact and the density of the alveolus to the distal. Again the same classification in this next; increasing density of the alveolus at the necks, marked contact with the second molar, where the tooth assumes a horizontal position.

This shows an extreme contact with alveolar line at this point, lower third molar completely in contact with the second molar, and the alveolus completely covering the distal surface of the third molar.

What I wish to demonstrate is this: That the basic principle of the entire operative procedure is based entirely upon your diagnosis, and your technic is then selected to govern the particular case, I agree with Dr. Lucas in his remarks as to good technic, and there are many cases in which, where there is light contact, as you see in the original picture, the technic described is an ideal technic.

I may say that I have appreciated Dr. Lucas's paper, especially its coming to the city of St. Louis, and its bearing on the battle of getting recognition of the importance of good operative technic in exodontia. I believe that men like Dr. Carl Lucas, Dr. Lyons, and many others over the country, are seeing the importance of this work, and I believe that we are beginning to show better operative procedure in connection with this work. I thank you for the privilege of addressing you.

CHICAGO DENTAL SOCIETY.

A regular meeting was held December 19, 1916, with the President, Dr. George C. Poundstone, in the chair.

Dr. Edmund Noyes read a paper entitled "A Developing Profession."

DISCUSSION.

DR. DONALD M. GALLIE:

Mr. President and Members of the Society: I question seriously the wisdom of Dr. Noyes and the committee in selecting me to open this discussion; nevertheless, I want to thank Dr. Noyes for inviting me to do so because I deem it one of the greatest honors I have enjoyed to open the discussion of this paper this evening.

I want to remind the members of the society that Dr. Noyes is the oldest practicing dentist in the City of Chicago in time of practice. There is no one practicing dentistry today, so far as I can learn, who has been practicing as long in the City of Chicago as Dr. Noyes,* and consequently no one is more fitted and more capable of reading a paper on the development of the profession of dentistry than Dr. Noyes. He has seen fifty years of practice. He has seen many changes take place and has been almost carried off his feet by the different enthusiasts and extremists who have been advocating this, that, and the other line of dental procedure, but he has never gone in the air. He has kept his feet on the ground. I want to say to the younger men of the profession, that I challenge any young man in the country, not only in Chicago, but in any other city, to do better, more modern, and more scientific dentistry than Dr. Noyes is doing at the present time. (Applause.)

The development or the evolution of dentistry is indeed interesting, and we will not go back to the time when it was started in America, but only back to the time when many present can recall instances in their practice. We have seen many different changes take place, and we have had many enthusiasts and extremists advocating the contouring of proximal surfaces of the teeth so that the foodstuff would not lodge on them and ferment and cause decay of these proximal surfaces. We have had men who strenuously advocated the use of amalgam entirely for the saving of teeth, claiming that as the teeth needed to be saved that gold was the poorest material to use. Only a few years ago we had men who told us that those who still believed that gold foil can be used successfully in the filling of the teeth were out of date; that they should be in the archives with the relics, and pluggers should be placed with the other relics of barbarism; and we have had in more recent years advocates, as you remember, of cataphoresis for the treatment and for the preparing of cavities. This wave swept the country Then came another wave which almost swept us off our feet, the question of analgesia, and it was said that no man could practice dentistry unless he applied this method. Nearly all of us can remember the early days of porcelain inlays, and then two or three years later there was another development or evolution or fad or fancy of the mind, namely, dentists were squirting emetin into every mouth or every gum that came for consideration or treatment. Tablets were offered to the profession that contained a minute quantity of emetin, and it was claimed that emetin cured all the ills that flesh is heir to. Nowadays we have some dentists who are not giving us office dentistry, but they are giving us dental journal and dental society practice. They are telling us that it is next to impossible to carry out certain things in our everyday practice and make practical application of them. We are told that we are a little behind. We have reached the stage where we advise drilling through to the apex of every root, no matter whether the canal is traceable or not. Now, we are told, there are many doing it successfully and doing it because in some cases it is absolutely necessary. But I must say we are a little behind our brothers in the east because at the present time we are not lionizing the ionizers, and in the east, in practicing modern or up-to-date dentistry, practitioners are treating disease of apical origin by ionization and are treating pyorrheal pockets by the high frequency method. It seems to me, that by following such a method we will have as much destroyed gum and injured alveolar processes as we had when every one was using cataphoresis without thoroughly understanding the peculiarities and dangers of the electric current. During all these waves that have passed over the profession, created by enthusiasts and extremists, Dr. Noyes and many others like him have always been ready to accept the best and latest in dentistry, realizing that all of these different lines of dental procedure have their limitations. The trouble with dentistry and with dentists has been that if they treat one case successfully with this or that method, they think it can be used universally.

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*Dr. R. F. Ludwig has been practicing in Chicago about two and a half years longer than Dr. Noyes.

Dr. Noyes points out one of the reasons why we are having this development, and it is through outside pressure from the public and from the medical profession. We appreciate the fact that there are members of the medical profession who are trying to advise us correctly, who are willing to consult with us, or are willing to have us consult with them, who are willing to give us the benefit of their splendid judgment and diagnostic ability, but we resent the pressure that comes from the medical practittioner when he says that such and such is the cause of trouble in that particular case; that certain teeth are pulpless, or the roots of teeth have been improperly filled, etc., and that therefore this or that is the cause of the systemic trouble from which the patient is suffering and which may terminate in death if not attended to. We all feel that some effort should be made to curb the medical practitioner who is trying to let the world know through the press what happens and comes out with extravagant statements that cannot be verified, and we have perhaps this thing no more strikingly illustrated than right here in the City of Chicago. The medical specialist is finding pathological conditions of the teeth which he says are the cause of general systemic conditions. In some instances that may be true, but in others it is not. There is the danger of going too far. We have some medical men here upon whom we can depend to give us advice, while what others tell us is misleading and alarming to people, working them into a state of hysteria so that they are hard to manage. The public, of course, are influenced by what they read, and the pressure of the public is a serious pressure because it is hard to convince them that we are right when they have been told through the papers so and so.

Dr. Noyes spoke of root canal work. We realize that there is nothing in the world perhaps so prolific of serious throuble as imperfect root filling or diseased root ends, and alveolar abscesses that come from it.

When Hunter made his first indictment against the dental profession there were a great many dentists who found fault with him, and the language used against Hunter was very strong; nevertheless, Hunter's indictment did more than anything that I know of to arouse interest, because he spoke particularly of septic roots and of the class of dentures and crowns and bridges that were made and called attention to the line of work which he claimed was certainly injurious. We all know that where we put in ten bridges ten years ago, today we are not inserting one. Instead of that, we have a scientific method of putting in partial dentures either with attachments or simply hold them up by suction, and the mouth is cleaner and we are getting better results. Hunter did a great service to the profession in calling attention to this class of work and its serious effect upon the general system.

In regard to the treatment of root canals, I give way to no one in my appreciation of the necessity of filling perfectly all root canals that it is possible to fill. I know there are some who will take exception to my statement when I say this: we have an X-ray machine in the office and we are not using it for the purpose of taking a picture of every tooth we work on. We are not unduly magnifying its importance; we do not have it in the office simply for show, but we use it in those cases in which we think it is necessary, and on account of having a machine we do perhaps take a few more pictures than the man who has not such a machine and has to send outside to have his X-ray pictures taken and interpreted. I find that there are many teeth that are not perfectly filled to the ends. You know and I know—let us be honest about it—that in our work we have some roots in which it is impossible to reach the apices. We have seen some X-ray pictures showing that root canals have not been perfectly filled, and yet at the apical region there is no sign whatever of any disturbance. Notwithstanding the deftness of hand we possess, there are root canals we cannot reach the apices of with a broach. I am afraid to use sulphuric acid as an aid because I cannot force it on in advance of my broach as far as I would like to, but it is easy to take sulphuric acid and work it into the dentinal tubules and walls of the canals below the point I am trying to go through. I have yet to find any man—and I acknowledge I am unable to do it myself—who can take a Gates-Glidden drill and go up into the root of a tooth and find a canal that is apparently obliterated and follow it up to the apex and fill it to the end. I believe that if we find from an X-ray picture that a root canal is not perfectly filled and no trace in the picture of the canal, and no trouble whatever at the apex, we should let good enough alone. When it comes to taking five hours to fill the root canals of teeth, who is going to fill all the cavities, who is going to make all the crowns and bridges and put in dentures for the millions of people who are seeking the services of dentists? As it is, we have enough canals that are giving trouble to devote our whole time without disturbing something that apparently is healthy and perfectly comfortable. That is my idea. I believe in reaming out the canals as much as possible, but I do not believe it is necessary to ream out canals in the buccal roots of upper molars or the mesial canals of a lower molar, so that you can look down through the roots to the apex. (Laughter.) I do not think that is necessary. We can fill perfectly canals in which we have succeeded in getting to the apex; we can fill them perfectly with a small root canal point.

As to the question of treating these canals with cotton wound on a broach, there is great chance of infecting the canals by winding the cotton in that way. We can wind cotton on a broach if the fingers are surgically clean, or if we put on rubber tips with which to wind the cotton. If you will pardon a personal reference, on account of this agitation and the necessity of precaution, many of you will remember that I gave a clinic at the last meeting of the Chicago Dental Society using a broach mandrel. We made broaches as fine as a hair, and it will wind a wisp of cotton so tight that you cannot push it down on the broach; you can withdraw the broach and leave the cotton clear to the apex without trouble. I believe these broaches can be kept clean, and if necessary, they can be sterilized. We cannot be too careful. We should take every precaution; nevertheless I believe we can treat canals without reaming them out to the extent of some advocates, and I think this: we feel safe in leaving some canals in which we cannot get the finest broach the way they are. Some speak of the apical millimeter of a canal and use it as an illustration, but that is an extreme idea in advocating thorough root canal treatment. I was in the office in a neighboring city of a dentist and he demonstrated to me how he treats root canals. He said, "I have my X-ray pictures, I keep them on my operating table, and as I deftly go into the canal I watch my picture to know where I am going." You and I know that we cannot always get the correct length of a root of a tooth by a radiograph because of the angle in which it is in the jaw and the angle in which the picture is taken. You cannot tell the length of the root. I said to him, "Cut out that stuff; don't tell that to dentists." Besides if the apical millimeter of a canal is not thoroughly filled, it is no more dangerous perhaps than the canals we find. We are told that many roots have multiple foramina. We have a cuspid tooth in the office which has five openings at the apex. With chloropercha we are not filling the little branches from the main canal. Dr. Callahan says he fills them with his rosin filling material. We do not fill them with chloropercha. We have some roots with fine auxiliary canals running into the main stream, as it were, and they are not filled just as the apical millimeter of some canal you cannot get into. I am referring now to the canals that we can not get into with the smallest broach to the apex without working with the aid of acid.

In regard to the question of dental hospitals, the more we look at it, the more the medical profession and public ought to understand the seriousness of the teeth as possible causes of systemic trouble, and I believe we are going to have an attentive ear to the necessity of having something in the shape of hospitals or postgraduate schools so that men can take postgraduate work, because our profession is no longer a profession simply of finger craft or craftsmanship; we have got to know something more than that. The time is at hand for us to have a thorough postgraduate course in the different dental schools.

So far as the future is concerned and the product of the schools, I have no fear whatever. It may be a few schools will do better and produce men who will do good work in practical dentistry as well as acquire a thorough knowledge of bacteriology, pathology and histology. The colleges of the future will not turn out men who are simply deft or skilled with their fingers, but these men will have a knowledge of the sciences, and I have a very hopeful vision that in the dental profession we will have a splendid revival, and an appeal to the profession to look to better work in the way of treatment of diseased roots and surrounding tissue is bound to result in great good, because it simply makes it plain to us that in the past we have been negligent, we have been careless, we have been indifferent, and this great agitation is bound to result in great good. We will still, of course, in spite of the papers that may be read by men who give much time to the study of these subjects, find a larger percentage of men who will continue the practice of dentistry, as there are certain men who continue to practice medicine, in an indifferent and slipshod manner; but nevertheless, dentistry is going ahead, and in ten years from now we will be as far in advance of present procedures as we are today in advance of the procedures of ten or fifteen years ago. (Applause.)

DR. CHARLES E. JONES:

I feel that I have been highly honored in being permitted to discuss the essay to which we have just listened. I am sure that all of you will have agreed with me long before I am through with my compendious remarks, when I tell you that I feel that I am inadequately prepared to discuss the splendid paper presented by Dr. Noyes.

While the paper possesses all of the peculiar and pleasing characteristics of the essayist's facile pen, I feel that I should want to discuss the author rather than the theme of the paper.

It was my very good fortune to be associated, early in my professional life, with this gentleman and I have always considered the influence he lent to that tempestuous and impressionable period as having been of the greatest value to me. He was then, and still is for me, the living embodiment of all that is high in the ideals and traditions of his profession. No other man with whom I am acquainted has been so consistently conscientious in carrying forward that which he knew to be just and right, in his relations in and out of his profession.

Since the day when first I beheld him passing before my then boyish vision, on his quiet and easy way to a well earned fame, I was deeply impressed with his culture, his training, his unostentation, his generosity of hand and soul. If I should seek the inward sources of this greatness, which has done so much for the general good of our profession, I would lay my hand upon his heart, and there feel the warmth that transmutes the souls of men into his anxious, eager emulators.

Dr. Gallie has spoken of Dr. Noyes as one of the older practitioners of our profession. This appellation does not in this instance carry the usual deduction that old age or long service means antiquation. Dr. Noyes has been represented in my eyes and in the eyes of all others as mature youth and I have never felt that the creeping years have lessened his acuteness to the possibilities of progress in his chosen vocation. I have always believed him to be "first by whom the new is tried but last to lay the old aside;" a man of the finer grain, inordinately equipped in the technics of his calling, who gives liberally of his training that others may profit. A gentleman in the full meaning of the word who spreads the spirit of sweetness and modesty about him wherever he goes; who stimulates others with a desire to live better and fuller lives; who disseminates fertile seeds in the fallow fields of his profession and who teaches us much of the amenities of life and gives us confidence of our unmeasured strength to conquer almost insuperable things.

I am convinced more than ever before, after listening to this able paper, that root canals can be properly filled and that teeth can be made serviceable away beyond any estimate we have heretofore put upon the value of these operations.

The profession of dentistry has, in the past year or two, been severely arraigned because of the failure of its members to recognize some of the causes of focal infections in the mouth. We plead guilty to the charge. We did not realize that so great a percentage of our root canal work produced rarified and infected areas nor did we appreciate the likelihood of metastatic material springing from these localized areas of infection about roots of teeth; no more than did our more profound brothers in the medical profession appreciate the injurious effects that we now know are almost certain to follow chronic, infected areas. We did not realize that vital tissues might become involved by the process of metastasis following our failure to observe proper aseptic precautions and to fill canals as they should be filled. No immediate ill results seemed to follow the slip-shod methods of treating and filling inexcessible and tortuous canals, pursued by most of us. Because no manifestations of excessively disturbed pathological conditions appeared within our immediate field following our operations, there seemed to be no reason for concern upon our part.

When some of our most eminent medical investigators called our attention to the fact that we were guilty of contributing, in no small measure, to a long line of lesions manifested remotely from our field, we began a very searching introspection, trying if we could, to place our finger on the weak spot in our structure. What has followed the investigations into our short-comings? There has been a converging period in which the medical man and the dentist got very close together upon the subject of focal infections. The metastatic nature of the bacterial elements and their elective affinity for tissues other than those found in the mouth and contiguous parts was the subject of much discussion, followed by a broader understanding of the causes and results in mouth and jaw infections. Our myopia in respect to our own short-comings was relieved. Things began to appear in their true light, and thus was our full resposibility realized. That each member of the profession of dentistry now shoulders his obligation in respect to the production of better dentistry is beyond question.

If the estimate that only ten per cent of the profession are competent to fill root canals (I can not vouch for the means by which this estimate was obtained), I venture that this incompetency has been much exaggerated by the failure of the members to understand the real responsibility they were supposed to carry in respect to these pathological conditions subsequently appearing in other parts of the body following inadequate root canal work. That we shall rise to the occasion now that we have been brought face to face with our responsibilities is beyond any doubt. Our colleges, in their teachings, are now laying greater emphasis upon root canal technic, and through this channel I believe the greatest development can be made. The X-ray is helping us, immeasurably, to realize our deficiencies.

Dr. Noyes has taken the incubus out of root canal operations. He has re-established our confidence to do well this particular class of technical work. He has simplified the technique of these proceedings and above all he has issued the dictum that root canals can be filled and that teeth can be made serviceable. He has endeavored to relieve us of the bondage of our mistakes and at the same time teach us that injudicious acts may at this time imperil our future standing. We have listened to-night to a sane discussion, supported by years of experience, of the root canal problem and I am sure that we all owe Dr. Noyes a debt of gratitude for his efforts as expressed in a "A Developing Profession."

Dr. James H. Prothero:

After listening to Dr. Gallie's beautiful peroration on the results of Dr. Noyes' experience in dentistry and what he has done for the dental profession I cannot add very much to what has been said. I want to say this, however, that there is no man in the dental profession in Chicago, or in the state of Illinois, or anywhere else in the United States, whose work has stood up and whose efforts have been directed more conscientiously to the benefit of his patient, and who has worked with that idea more clearly and honestly, than has Dr. Noyes.

Dr. Jones touched on a point which is of vital importance here, and I think we all ought to bear it in mind, and that is the responsibility of the dentist to the patient. Dr. Noyes mentioned it in his paper. He did not emphasize it as much as he should, yet it is there.

I wonder how many of you have heard about or read the report that Dr. Rosenow made before the American Medical Association in Detroit last summer. It may have been spoken about at some of these meetings, but I am going to mention it tonight in a brief way. He recited the case of a patient who presented at the Mayo Clinic or Hospital in Rochester suffering from a complication of troubles, but principally arthritis. They put him through the various examinations of which you know, which cover practically all portions of the body to discover any possible remote disease. The mouth was radiographed; they found nothing whatever as to the source of infection in any part of the body. Finally, they went back and renewed these examinations; they made another X-ray of the mouth and this time found trouble around a tooth, the roots of which had been filled previously. They had discovered this in the first examination, but in the second examination they found that there was one of them that had not been filled to the apex. They took it out with the intention of digging out an alveolar abscess and seeing if they could find any pus pocket in the bone. The X-ray disclosed no such communication of any pus pocket being present, but they thought perhaps it might not be shown by the radiograph. So the tooth was extracted, and before burrowing out the sockets, each socket was scraped with a platinum spoon and cultures made. These cultures were injected into guinea pigs and arthritis was produced. The burrowing process was carried out; no pus was found, but the patient recovered. The deduction drawn from the case was that the germs of infection were present in the apical space, not with sufficient potency to break down or to set up the formation of pus, but yet they were in a way the prime cause of the systemic disturbance. That was a case against careless root filling, or against the method Dr. Gallie mentioned where he said he could not fill the apices of all teeth; at the same time, we all know we have all filled roots of teeth throughout the greater portion of the length and have not been able to fill the apex. I have done it myself, although I had no X-ray to show it. We have all done it. Many of these roots of teeth which we have imperfectly filled have given good service for ten or even twenty-five years; they perhaps never will give any trouble, and yet we do not know what minute we are going to meet with trouble. So it is well enough to be cautious and try to get to the apex of the tooth. But I do not believe in drilling through or believe in the ionization process. I believe the methods suggested by Dr. Noyes, and which he has practiced all these years, and with which he has achieved success, are good methods.

The responsibility of the dentist to his patient brings up another thought. When I was a little boy my brother was a physician and in active practice at that time. My brother-in-law was also a physician and in practice at the time. The one pleasure of my life was to visit my brother and brother-in-law who lived thirty miles away. They were in partnership in a town of 8,000 or 10,000 inhabitants. The one thing that impressed itself on my mind in those days was the amount of charity work these two men did. There is in all communities, as you know, a class of people, who through ignorance or unfortunate conditions or sickness, or for some reason or other have been unfortunate and poor, and never will be otherwise. They become ill and must receive medical service. They cannot pay a physician who attends them, and the chances are he never will receive anything for attending them; yet physicians for many years take that class of people who are not able to pay and never will pay and care for them. I have often thought that much good might be done by dentists in this way. There are about 45,000 dentists in the United States, and if we figure out the population of the United States and divide it by 45,000, there are 2,200 of the population to every dentist. Nothing like that percentage of people ever employ the service of a dentist. Many of them do not call on a dentist because they have no money, and the man who sets himself up as a man who must receive a fee for every case and receive the highest possible fee, is not doing his part in this great charity work. Until some means is taken by the municipality for taking care of dental work of the poor people every dentist ought to feel called upon to do a little towards taking care of these indigent people who are deserving of just as much attention in the dental line as in the medical line at the hands of the medical profession. Sometimes when I go to a dental meeting and hear a discussion as to how much we can get out of a patient, and how to get the highest fees, it makes me creep. I feel as if the esprit de corps which is so noticeable among medical men is entirely lacking in the dental profession. It is not right, gentlemen. We ought to think of our patients; we ought to have their welfare at heart, and we ought to be willing to do our part. The question of fees will regulate itself. When a man has the ability to do the work for a patient who presents himself, who is able to pay, that dentist can sell his service to that patient for what it is worth, and furthermore, that he will charge the man in more moderate circumstances according to what he makes, so that at the end of the year the high fees he gets added to the medium fees will give him a reasonable compensation for his year's labor. That is the only way in my mind the thing can be arranged. We cannot have a class of dentists who will work only for the rich, and another class who will work for those in moderate circumstances and so on down. Every dentist has a class of patients that varies very materially, and he should adjust his fees according to the ability of the patient to pay and do his part in taking care of these people who are unable to pay large fees and those who are unable to pay any fee at all.

One other thought and I am through. We ought to work for the establishment of dental hospitals to supply dental service to the people who are unable to pay. It is just as important, because we know and medical men know that unless the dental work of people is frequently taken care of, complicated diseases will arise, and if we can catch them at the start it will obviate a great deal of the sickness and unhappiness and disease and death. If we can put it up to the mayor of the city and to the various officers of the municipality and encourage them to help us in this matter, show them the importance of it, something will have been accomplished. They understand it, but it will require more pressure to bring it before them, and we will be doing a service for the next generation and for humanity such as the dental profession has never been able to do before.

I want to compliment Dr. Noyes on the able paper he has given us tonight, and I hope that we shall have the pleasure of having him with us for many years to come. (Applause.)

DR. C. N. JOHNSON:

I should feel remiss if I did not get up and say a word or two in commendation not only of the paper but of the essayist. Much has already been said, but I can tell you that we may spend a whole evening and not exhaust the virtues of the essayist of the evening. I will just refer to two things in Dr. Noyes' paper, and one of them has been mentioned by the men who have discussed it, and that is with reference to the remarks of Hunter some years ago. There is a misconception in the profession as to Hunter's attacks on dentistry. The things that we are most afraid of now are apical infections. Hunter did not refer to apical infections at all in the articles I saw from his pen. He referred to septic conditions around the gum margins from dental operations and to them solely. Hunter did not recognize apical infection. I want that corrected because he gets the credit today of having initiated this movement in connection with infection from pulpless teeth. He referred to bridge work and crown work and so on. I want to go further and say that he was unjust in his criticism because he selected a certain class of work and condemned the whole profession on the basis of that work when the whole profession was not performing that kind of service at all.

Just one other point: Dr. Noyes' statement tonight in connection with the subject of the filling of roots of teeth is the sanest and most hopeful thing that I have seen published for years. (Applause.) It robs that operation of much of its intricacy that has been heralded so widely and which he has intimated has probably discouraged many men from performing that operation. The operation of root filling is not such a difficult and terrible thing as we have been led to believe. I want the profession to read carefully what Dr. Noyes has said on that subject, and when they do they will try their best to fill pulp canals. Many of them cannot do it as well as Dr. Noyes can, but I believe day after day they will be doing better service if they follow the precepts he has laid down in his paper.

I want to pay my personal tribute to Dr. Noyes. He has been an ideal to me. I have had the pleasure of saying that many times, and it is a pleasure to say it. I know of no man in the profession whose influence for good has been more constant and consistent and certain than that of Dr. Noyes. (Applause.)

DR. TRUMAN W. BROPHY:

Since I have been asked to say a few words in regard to Dr. Noyes' paper, I do so with pleasure. I have known Dr. Noyes a great many years. The first of April, 1867, I entered upon the study of dentistry in this city. In October of the same year Dr. Noyes came here. He occupied an office at 93 Washington street, which was between Clark and Dearborn, fronting south. It was on the second floor. When I came to Chicago I visited every dentist in the city. There were 74 in Chicago at that time. The population of the city then was 187,000 people. I called on him as I did all the others. I found a young man, slightly built, who did not look to me as though he would be strong enough to practice dentistry very long, but here he is tonight and apparently just as strong or stronger than he was then. In my long acquaintance with Dr. Noyes I have always had for him the greatest regard. I will say it with all sincerity that he has not done a thing in his life that is not worthy of a man high in the profession. I believe his every impulse has been noble, and that he has been one of those whose example every young man might emulate to the greatest advantage. His place in the profession has been one filled with modesty to the highest degree and he has, as others have stated, been an ideal practitioner. I cannot add more than to say that shortly after he arrived here, in conversation with some men whose names were coextensive with the practice of dentistry, one of them (Dr. Allport) in commenting upon him said, "Brophy, there is a man whose operations in operative dentistry are among the finest that the profession has ever known." Those of you who have had an opportunity to see his work realize full well how beautifully finished it is. I said to Dr. Cushing when I became acquainted with him, "Do you know Dr. Noyes who has just started here?" He replied, "Oh, yes, I have met him." I said, "Have you not had an opportunity of seeing some of his operations?" He replied, "Yes, they are ideal." All who knew those two men know they were not going to make remarks of that kind unless they were based on absolute facts.

I might talk for half an hour or an hour about the place that this man has filled in our profession. I believe he has contributed as much as any one who ever lived in this city to the upbuilding of the profession, to making it worthy of the recognition of the members of other professions.

I came here tonight just because Dr. Noyes was going to read a paper. For the past two weeks I have been at home ill in bed most of the time but I said to Dr. Johnson, "I am going to that meeting because I want to pay my respects to the man who has done so much for the upbuilding of the profession in this community." It is not only what a man does in his manipulative work and in his practice, but it is the man's life, the man's character that makes an honored place for him in a community, and Dr. Noyes has always stood as one of the most upright men in this city, and I hope he may live and practice and give to the young men the benefit of that beautiful life many years to come. (Applause.)

Just a word about root canal filling and I am done. The mayor's proclamation that was issued recently, and the work of the Commissioner of Health and the Superintendent of Schools will give to the young practitioner an immense amount of work to do. May not this lead to the early recognition of diseases of the teeth and prevent the invasion of the dental pulp and its loss? The ideal dentistry of the future will be prophylactic, the prevention of decay, the prevention of the invasion of tooth substance with caries. When we have impressed upon teachers in the schools and parents of the children so that they will look to these things long before the children have reached the school age, and see to it that caries does not make such progress as to leave the pulps of the teeth dead and septic, conditions that may lead up to destruction not only of the teeth but of the alveolar process, and finally destroy health by metastases, then we will have reached the ideal.

I trust that the work that is being done here tonight may lead to an awakening on the part of the people of the whole community to the necessity of caring for the teeth of children, to prevent the exposure of dental pulps, and prevent declarations from going out that the teeth are the causes of general infection when they have no positive proof to that end.

Dr. Noyes (closing):

This discussion has gone pretty wide of the subject in a great effort to spoil the essayist, and I do not see how I can say anything except to express my thanks for your good opinion, and a wish it were more fully deserved.

Just a word or two about the discussion. Dr. Gallie referred to roots which the X-ray shows not filled to the end. In examining these X-ray pictures I think we should notice very particularly whether there is any pulp canal beyond the filling, or whether the X-ray shows an unfilled canal beyond the filling. You will find X-rays of both sorts, and, of course, if you can see that a portion of the canal is unfilled, there is no question whatever about the advisability of opening it and filling it better. But by all means, when you work at the pulp canal of a tooth, work at it long enough to be sure that you cannot get any nearer to the apex than you have gone, and so that you do not believe anybody else can. If you will do that every time, there will not be a great many root fillings of your own that you will be called upon to dig out again.

Some reference was made to the teeth that develop abscesses after filling. If there is anybody who has not an experience of that kind, I wish I could see him, I would like to shake his hand. I have had a very considerable number of such cases in forty-nine years' practice that developed abscesses, usually over the buccal roots of upper molars or the mesial roots of lower ones, and when they did I believed, of course, that the pulp canal fillings had not been perfect and I had a strong suspicion that they were not as perfect as I might have made them.

Something was said about the obligation of the individual practitioners of dentistry to do charity work. I did not refer to that in my paper, but it is an important point, and I hope that the impression that the profession are generally remiss in that regard is not correct. My own feeling in the matter is that every man ought to do some charity work. He may arrange it in one of two or three different ways. He ought to have, in the first place, a standard of fees which will give him a margin for doing a material amount of work at greatly reduced fees or for no fees at all. I thought in the early part of my practice I had no right to make one man pay me for what I was doing for somebody else. I have gotten over that entirely for two reasons. In the first place, it is my particular privilege to compel some of these people to help poor people a little through me. In the next place, there is not a great deal of danger, in the case of most of us, that we will get any more from the higher fees than our work is really worth to the people we are doing it for, so on that ground they cannot call us robbers. But every man in the profession ought to do a certain amount of work for which he does not receive full fees and some probably for which he does not receive any. This is more necessary and more incumbent upon us on account of the lack of public opportunities for poor people as the medical profession have provided. Medical men may make some little excuse in a large city like this for turning aside charity work, because there are places where charity patients can go, but the dentist has not that excuse.

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. IV.

My Dear Boy:

I fear that so far in these letters you may have the feeling that I have been preaching to you. I cannot help it. It is not my intention to preach or be prosaic, nor would I inflict myself upon you as a nuisance. I am even going to make the confession that I do not like to be preached to myself; and yet as I look back over my career and see the pitfalls into which I have blundered, as I contemplate the awful mistakes I have made—so very many of them that I blush to think of them while I write these lines—as I see in perspective where I might have bettered my career and made myself more useful in the world, I cannot help feeling that I wish some one had taken sufficient interest in me as a boy to write to me as I am writing to you. And I honestly believe I would have read and heeded. Maybe not—boys are peculiar.

Which gives me the opportunity of saying at this time that you are under no obligation to read these letters, and I shall not feel hurt if you do not. In fact I have sometimes wondered just why I began writing them to you, because you certainly did not ask me to. The only reason I can assign is because for years I have felt that some one should say these things to you, and as no one else seemed to do it I could not hold myself any longer. I suppose, therefore, that in the ultimate analysis there is a selfish motive behind it. —I had to do it for my own peace of mind. Whether or not you heed what I say I shall feel that I have at least done my best for you.

There are so many requisites for successfully conducting a practice that I scarce know where to begin. Of one thing you may be sure that with all I have previously said there is one thing of supreme importance which will affect your prospects in a very practical way, and that is the matter embraced under the generic term of cleanliness. You have heard this all through your college course, and yet I doubt whether you fully appreciate its full significance. This is the age of asepsis and cleanliness, and the very first thing you must do is to provide in every way for the most rigid adherence to the laws of hygienic cleanliness. Face the fact at once that you are practicing a most exacting profession. Above all, the instruments you use should be kept scrupulously and surgically clean. And in this do not depend altogether upon boiling or sterilization. Instruments which come in contact with the tissues of the mouth should invariably be thoroughly scrubbed with a brush carrying soap and water before being placed in the sterilizer. This is where many operators fail. The virtue of the sterilizer is magnified in their minds till they lose sight of the most important adjunct to sterilization, viz.: thorough cleanliness. I am almost tempted to say that if I had to choose between instruments which were merely brushed or rinsed off in a perfunctory way and then placed in the ordinary sterilizer, as is usually done, and those which are rigorously brushed free of any accumulations with soap and water, and then carefully wiped dry with a clean cloth, I would take the latter every time. When we remember the debris which lodges in the angles formed by the blades of scaling instruments or clings to the surfaces of all instruments which come in contact with the soft tissues, and then when we think of the inevitable loading of this debris with microorganisms, we can realize, if we would, the imperative necessity of its thorough removal. Think of these things, my boy, and sometime when you have just dismissed a patient from the chair pick up the instruments you have used and examine them with even a high magnifying glass, to say nothing of a microscope, and see what you find. Do this a few times and I trust it will impress you with the necessity of getting rid of this material before putting the instruments in another mouth.

A cardinal rule to follow is never to use an instrument on any patient which you would not willingly have used in your own mouth. Adhere to this rule rigidly, day after day, and cleanliness of instruments will become a fixed habit.

Next in importance comes cleanliness of person. The cheapest thing to use in dental practice and the most expensive thing not to use is a combination of soap and water. I need not offend your intelligence sufficiently to go into details, but I beg of you in all seriousness not to grow careless in this matter. A dentist should always be the personification of cleanliness even to the point of fastidiousness. No detail of personal hygiene should ever be omitted, no pains considered too great to keep yourself immaculate.

This is a consideration you owe your patients, yourself and your profession. Nothing else can compensate for carelessness in this respect, nothing else can minimize its importance.

And let me whisper something in your ear at this point. I have practically promised not to moralize with you. I despise a man who is always prating about goodness—I am suspicious of him. I have seen too many moral lepers who have done this thing—have seen the greedy hand of lust reach out and besmirch the innocent while mumbling a moral on the lips, and I hate it. I hate it with all the horror of my heart, and with all the agony of my soul. I believe more in the efficacy of one kind and righteous act than in a million sermons, and believing this I fain would spare you a single word on the moral side of your professional life. And yet the consideration of cleanliness is not complete without a reference at least to the most important cleanliness of all—the cleanliness of the mind. In professional life it is a misdemeanor to have unclean hands—it is a crime to have an unclean heart. Guard your thoughts, and govern your acts, as if your very life depended on it. All that is worth while in life does depend on it. Preserve your perfect manhood always in the presence of your patients. Think clean thoughts, and do good deeds; and live day by day in your professional relationship as if this were the most sacred thing in life. Outside your family circle it is.

Pardon me, my dear Boy, but I had to say it.

Sincerely your friend,

C. N. J.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Handling Temporary Stopping:—When temporary stopping refuses to go to place do not delay by reaching for another instrument, but just reverse the one you are using and put it to place with that.—*James W. Cormany, Mount Carroll, Ill.*

Swaged vs. Cast Aluminum:—An aluminum base plate for a full upper denture should be swaged rather than cast. There are several reasons, among them are these, namely: The swaged plate is lighter. The rim can be bent inward to get the advantage of the under cut of the alveolar ridge, and the heel of the plate can be bent upward to bring it into closer contact with the soft parts of the palatal surface of the mouth, while the cast plate is inflexible. —*H. A. Cross, Chicago, Ill.*

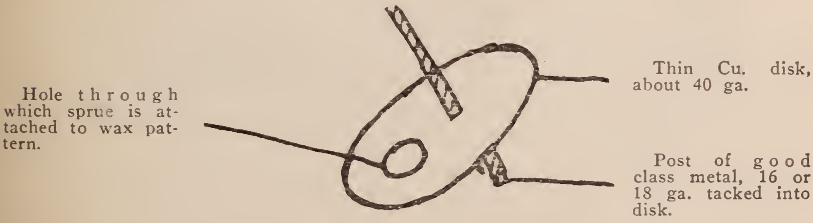
To Keep Fissure Burs Effective:—The new tapering, cross cut enamel fissure burs invariably become dulled on their outer ends while the portion nearer the shank is still "as good as new." By grasping the dulled portion transversely in a pair of pliers, the dulled portion may be broken off and the remainder of the bur will answer many a useful purpose—as in the heavy cutting necessary in opening up pulpless teeth, etc.—*Arthur G. Smith, Peoria, Ill.*

Supervision of Patients:—One of the most practical things we can do for a patient is to put the mouth in a healthy condition by prophylactic treatment, and then supervise the case by frequent examinations and close observation as to care or neglect on the part of the patient. A good time to make an impression on the patient's mind is during a series of sittings for restoration or prophylactic work, when the result of neglect is most apparent to him. The prevention of trouble is more practical than the relief of trouble. —*E. A. Schmuck, Chicago, Ill.*

To Make Old Teeth New:—To repair old plates or attach a tooth or teeth to an old vulcanite plate, the electric furnace for porcelain work is a great help. Nearly all dentists have old vulcanite teeth about the office. Select your tooth and if too white add a thin coat of much darker shade of porcelain. Put in the furnace and fuse at 2300 or whatever heat your porcelain calls for, and nine times out of ten you will have a tooth that is better adapted for repair work than a new one. To give old teeth one good bake in the electric furnace is good practice, especially for those with large platinum pins. In most cases they are stronger and better than the modern teeth of today.—*Geo. D. Sitherwood, Bloomington, Ill.*

Crown or Bridge Facing:—A very good crown or bridge facing is made from the ordinary rubber tooth. Select a rather thick tooth, cut off the pins and flatten the back, also flatten the mesial and distal sides by grinding slightly. Then cut a groove running approximately from the middle of the mesial cervical line to the mesial contact point or a little anterior to it, also the middle of the distal cervical line to the distal contact point or just anterior to it. These grooves should be just deep enough to give sufficient strength to the backing which is made by casting from a wax model made over the lingual side of facing and into these grooves. The facing forms a simple dovetail in the backing, making a very strong combination. The incisal edge is free of metal giving the translucent effect so much desired, and the metal extensions on the mesial and distal surfaces are hardly discernible, or at most have the appearance of small fillings.—*Frederick W. Stephan, Chicago, Ill.*

Cast Coping for Dowel Crown:—In desperate cases where decay is beyond the gum margin, shape a thin copper disk about 40 gauge to suit the case. Through this force a dowel of clasp metal 16 or 18 gauge, and tack it to the disk. Place some casting wax about the post and disk, and after heating it force the whole to place thus getting a good adaptation of the wax to the periphery of the root and alongside the dowel. Attach a sprue to the wax through a hole in the copper disk made for this purpose. Invest the whole mass and after heating the flask will cast in the usual way. The thin copper disk becomes alloyed (swallowed up in the molten gold). The post of clasp metal will not disappear but serves to make a very rigid dowel. It is surprising how well, even in a short canal, such a post will hold, due to the inlay fit. This is good for a crown base or a Gilmore attachment.—*W. F. Lawrenz, Carpinteria, Cal.*


Hole through which sprue is attached to wax pattern.
Thin Cu. disk, about 40 ga.
Post of good class metal, 16 or 18 ga. tacked into disk.

MEMORANDA

NEBRASKA STATE DENTAL SOCIETY.

The Nebraska State Dental Society will hold a Jubilee in celebration of its fiftieth annual meeting, June 4, 5, 6, 7, 1917, at Omaha, Nebraska. All members of the National Society are cordially invited to attend.— H. E. King, Secretary, Omaha.

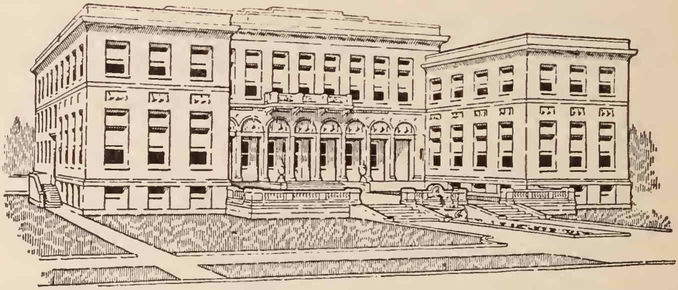
THE GEORGIA STATE DENTAL SOCIETY.

The forty-eighth annual meeting of the Georgia State Dental Society will be held at Brunswick, Ga., June 14, 15 and 16, beginning Thursday, June 14th. We extend a most cordial invitation to members of other associations to meet with us. For application blanks and full particulars, address M. M. Forbes, Secretary, 863-64 Candler Building, Atlanta, Ga.

TEXAS STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Texas State Board of Dental Examiners will be held in the Central High School Building, Houston, Texas, beginning Monday morning, June 18th, at 9 o'clock. No diploma's exchanged; no reciprocity. A fee of $25.00 should be in the hands of the Secretary not later than June 13th. For further particulars and application blank address, C. M. McCauley, 840 Wilson Bldg., Dallas, Texas.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK, FORTY-NINTH ANNUAL MEETING, MAY 10, 11 AND 12, 1917, AT CONVENTION HALL, ROCHESTER, N. Y.



DEDICATION OF THE ROCHESTER DENTAL DISPENSARY, MAY 9TH, 1917.
FOUNDED BY GEORGE EASTMAN.

Rochester's new Dental Dispensary will be formally dedicated May 9 in conjunction with the forty-ninth annual convention of the Dental Society of the State of New York, May 10, 11, 12. Men of national reputation will be here with messages of vital importance to you. Make your reservations today—The Committee. Edward G. Link, chairman, 226 Cutler Bldg., Rochester, N. Y; Louis Meisburger, Buffalo, N. Y.; Wirt H. Conklin, Rochester, N. Y.

INDIANA STATE DENTAL ASSOCIATION.

The fifty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel in Indianapolis on May 15-16-17. A very good program of papers and clinics has been prepared and a sincere invitation is extended to members of other State Dental Associations to attend. A. R. Ross, Secretary.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The 1917 meeting of the N. A. F. D. will be held at the Astor Hotel, New York City, Friday and Saturday, October 19 and 20, 1917. Executive Committee will meet 9 o'clock A. M. and the general session will open at 10 o'clock as usual. Chas. Channing Allen, D. D. S., Sec'y, N. W. Cor. 10th and Troost, Kansas City, Mo.

KENTUCKY STATE DENTAL ASSOCIATION, FORTY-EIGHTH ANNUAL MEETING, LOUISVILLE, KENTUCKY, MAY 9-10-11, 1917.

The next annual meeting of the Kentucky State Dental Association will be held at Louisville the three days previous to the Kentucky Derby, May 9, 10, 11, 1917. Address all correspondence to W. M. Randall, Secretary, Louisville, Ky.

TENNESSEE STATE DENTAL ASSOCIATION.

The Golden Jubilee session of this splendid society will be held in Memphis in June and the whole dental world should know about it. The Tennessee men; and particularly the Memphis men—and women—are making especial efforts to assure the success of the meeting. The President for this Jubilee year is our old Illinois friend Dr. D. M. Cattell, and the mere announcement of this is sufficient to guarantee that things will hum in Memphis at that time. Dr. Cattell writes as follows about the coming meeting:

"Both the sessions and the exhibits will be held in the same building—the Scottish Rites Temple, out on Union avenue, one-half block from the Dental College. It is just outside the industrial center of the city, within a block of two lines of street cars, running out from the Hotel district. The audience room of the Temple is all but sound-proof having a line of class rooms surrounding it. The room is cooled by gentle breezes floating over tons of ice into the auditorium and as it becomes warmed and rises to the dome it is there drawn off by large suction fans. Surrounding this auditorium on two sides are the class rooms, at the back of it is a large stage and at the front there is a rest room the like of which is not equalled in any of the clubs of the city.

"The exhibits of the Dental Manufacturers Club, which includes 40 of the best class supply houses, will be in the large hall; a space equal to the auditorium and the stage combined. The small exhibitors will show their wares in the side class rooms. From the hotel there will be a line of automobiles running out to the Temple every morning in ample time for the meeting, giving plenty of time to look over the exhibits. These automobiles will carry the visitors to the Temple for the morning session and evening session. Luncheon will be served in the building from the Temple kitchen—somewhat in the style of a cafeteria. After luncheon, until the gavel falls, the crowd will have the benefit of that rest room and the beautiful little park just across the boulevard—a splendid place to loaf and take the fresh air.

"There will be but one night session and the public entertainment that night, in all probability, will be given by Dr. Charles Mayo of Rochester, Minn. Dr. Mayo has not positively promised, but the program committee is expecting him to be with us. The program committee has secured for the regular session work several other "high brow" entertainers, who will bring their magic lanterns and moving picture shows with them.

"It being the 'Jubilee' year it is hoped that the gentlemen will bring their wives or sweethearts, as we propose to care for the social side of life as well as the intellectual. For the visitors there will be a moonlight boat ride on the great "father of waters." There will be an automobile drive covering the beautiful boulevards, driveways and parks of the city. In that, we will have a surprise for all those who have not covered the ground. But few people know of the beautiful driveways, palatial residences and artistic park system of Memphis. Of course the banquet will be a prominent feature, with the flowery speeches that belong to the orators of the south. For the visiting ladies, while the men are hard at work, there will be other entertainment such as luncheons, drives, shows, etc. This will be managed by a committee of ladies. So, the social as well as the professional entertainment will belong to this Golden Jubilee meeting. We invite all the dentists and their families to come south in the delightful month of June, when the roses are all abloom and the flowers flash their colors from every nook and corner. June is not the hot month in this part of Tennessee, so, the invitation is, come; one and all!"

A TRIBUTE TO DR. WILLIAM C. WENDEL.

Dr. Wendel, one of the best beloved practitioners of Milwaukee, having retired from active service at the chair, was recently made the recipient of the following tribute by his long-time friend, Dr. Charles C. Southwell, in a "night letter" sent to Philadelphia to be read at a class dinner:

"Dr. M. L. Rhein,
Care John A. Reimold, University of Pennsylvania, Philadelphia, Pa.

"After intimate professional comradeship of thirty-six years, I deem it a privilege to pay tribute to my classmate, Dr. William C. Wendel, who without war-baby aid is now so happily placed that he may join the few of our profession who have had the keenness to gather and the wisdom to retire with some pep left."

DR. WILLIAM C. WENDEL.

(With Apologies to Edholm.)

He's always been oblígin',
In pictures looks a saint,
And God who limned him out of mud
Said "I sure know how to paint."

He's lent me ready money,
Quite often in our day,
He even likes the brand I smoke
But that's dear William's way.

He's quite some quick and clever,
I observe this as a rule,
And yet the times we've disagreed
The tother seemed a fool.

But still it somehow thrills me
To grip his loyal hand,
I guess the thing that made us stick
Is that we understand.

I understand the varmint,
Sometimes he savvies me,
And that's what makes a man a pal
As far as I can see.

So here's to you, William Wendel,
May your bright eyes ever shine
And when the end of all things come
May your final home be mine.

Dr. Charles Southwell.

PATENTS OF INTEREST TO DENTISTS.

1149016. Artificial tooth, Frank L. Argall, San Jose, Cal.
47669. Design, tooth brush, Wm. J. Hunt, Memphis, Tenn.
1149328. Molder's flask, Otto R. Berger, Cleveland Ohio.
1149376. Material for cleaning teeth, Wm. A. Leonard, Riverside, and S. W. Boynton, Chicago, Ill.
1149239. Crown tooth and pin therefor, James L. Williams, Pelham, N. Y.
1150729. Pinion puller, George E. Austin, New York, and F. Lachance, Brooklyn, N. Y.
1150102. Casting dental plates, James R. Cruickshank, Calgary, Alberta, Can.
1150772. Opaquing agents for the production of white enamels, Ignatz Kreidl, Vienna, Austria-Hungary.
1150467. Opaquing composition for enamels and the like, Josef Weber, Essen-on-the-Ruhr, Germany.
1151252. Dental matrix retainer, Charles J. Emerson, Omaha, Nebr.
1151253. Dental matrix retainer, Charles J. Emerson, Omaha, Nebr.
1151352. Introduction and retention of dental filling materials, Carroll H. Frink, Jacksonville, Fla.
1151361. Dental jig polisher, W. Lee Hunter, Seattle, Wash.
1151200. Dentist's anvil, Arthur S. Levy, Birmingham, Ala.
1150879. Dental syringe, Matthew Payne, Yonkers, N. Y.
1152281. Dental instrument, Garfield H. Bretsch, San Diego, Cal.
1152317. Dental vulcanizing flask, Ernest A. Hewes, Esbank, Dalkeith, Scotland.
1152187. Matrix cleaner, Elmer L. Kokanour, Rogers, Ark.
1152122. Connecting bracket for dental handpieces, Orin C. Samphere, Milwaukee, Wis.
1152711. Matrix retainer, Francis M. Dean, Anacortes, Washington.
1152825. Dental floss holder, Isaac W. Litchfield, Boston, Mass.
1152964. Manufacture of dental models, Wilhelm Nielsen, Bielefeld, Germany.
1152985. Acetylene blowpipe, John W. Smith and E. H. Smith, Minneapolis, Minn.
1153486. Artificial denture, Adolphus E. J. Gregg, Los Angeles, Cal.
1153801. Tooth brush, Russell L. Long, Morgantown, W. Va.
1154942. Dental face bow, George B. Snow, Long Beach, Cal.
1155020. Saliva ejector, Leander Van Orden, Alameda, Cal.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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THE
DENTAL REVIEW.
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THE PREEXISTING LESIONS IN THE ORAL CAVITY AND THEIR RELATION TO MALIGNANT DISEASES.*

BY JOSEPH COLT BLOODGOOD, M. D., BALTIMORE, MARYLAND.

Mr. President, Ladies and Gentlemen: I am going to follow the advice of a famous senator who said it was always best to thank the audience first because as one got interested in what he was saying he was apt to forget to thank them at the end of the paper.

I appreciate more than you can realize not only the honor of this invitation and the opportunity to bring you a message, but I also appreciate that this invitation has been a stimulus to me to devote a great deal of time and labor in the last few months, and especially the last few weeks, to a re-investigation of the cases that I am going to talk about tonight.

With cancer of the mouth, as with cancer elsewhere, we are beginning to feel we have a working basis; in fact, we are beginning to realize that some forms of cancer can be prevented, and I think I shall be able to show you tonight that a large number of malignant diseases of the mouth can be prevented by oral hygiene. I mean by that the education of the public in regard to the hygiene of the mouth. The mouth is a part of the body that should not only be kept clean, but the sources of irritation should be reduced to a minimum by the care of the teeth and by moderation in tobacco. In a smaller group I feel we can educate the public to come to us in time and educate ourselves to the differential problem when we will recognize a pre-existing lesion before it is cancer, or in such an early stage of cancer that a cure can be accomplished not only with a large per cent, but with a very small per cent of mutilating operation. For those lesions which cannot be prevented, if we are given the opportunity by the education of the public to see them early, we have the problem of a difficult diagnosis but a much more simple treatment with a better result. While in the past we have made the diagnosis with little or no difficulty, an operation of great mutilation has been necessitated with little hope of a cure.

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*Presented before the Chicago Dental Society, Jan. 26, 1917.

Fortunately, the Census Bureau has just published the total number of deaths in the registered area for 1914, and I find there are 52,000 deaths from cancer. Of course, I have not the figures of the total number of deaths. My friend, Dr. George H. Simmons, editor of the *Journal of the American Medical Association,* in reading these figures this morning said it would be much more interesting, and perhaps more forcible, if it was compared with the total number of deaths, but 52,000 deaths per year in the registered area is large enough to impress us with the fact that cancer is a great problem.

Now, the deaths from cancer in the oral cavity are 2,270. I will not go into the relation with others, but my feeling is that over fifty per cent are preventable and 25 per cent more probably would be curable with a very slight operation. The mortality, therefore, from cancer of the mouth is 2,270 in the registered area of the United States in 1914.

I am going to say something in a moment about the relationship between oral hygiene and infant hygiene, and I think perhaps you would like to know the number of deaths in the same year in infants under one year of age, namely, 72,572 of a total number of deaths of 776,000. So you can see the deaths up to one year of age in infants, which is very marked, is a little larger than the number of deaths of those who survived from cancer. The cases I will speak to you about are reported in the Surgical Pathological Laboratory of the Johns Hopkins Hospital. In the earlier years they were taken only from the Johns Hopkins Clinic, but in more recent years all of the cases from my clinic from St. Agnes and many cases from the clinic of Dr. Finney at the Protestant Hospital, and a large number from outside sources, so that it represents more than our own experience. For that reason, I have not compared it with the total number of cases in the clinic; but the total number of recorded cases of lesions, either benign or malignant, in the oral cavity in which we have records in these twenty-five years is 638, while the total number recorded from cancer of the skin of the external parts is 934.

If we turn to the total number of deaths in 1914, we find 2,270 from the oral cavity and 1,967 from the skin. Why is the total number of cases in our skin clinics greater than the total number of cases of cancer of the mouth? It is due to the fact that cancer of the skin is recognized earlier and becomes more operable after a longer period of time. That is why we cure more cases of cancer of the skin. When I have the total number of cases of cancer in any locality and compare them with the total number of deaths, the group in which our results are worse, it corresponds with the group in the mortality statistics in which there are a greater number. For example, in cancer of the tongue, the total number of deaths is greater than the total number of cases of cancer of the lip, while cancer of the lip is a far more common form of cancer than that of the tongue, but our cures of cancer of the lip are greater than those from cancer of the tongue. They represent something like 15 to 60 per cent, 15 per cent for the tongue and 60 per cent for the fully developed cancer of the lip.

It is very interesting to have observed in the last few years that the mortality statistics really tell us what our operative results are in cancer.

In studying the relation of cancer to some etiologic factor, the investigation of 1,667 lesions of the mouth and skin brings out a very important fact. Grouping them—mouth, face, scalp and the rest of the body—why is it the oral cavity ranks first with 638 cases? Because the oral cavity in the civilized individual is subjected to more chronic irritation than any other part of the external body. Our habits of eating, hot and cold, and the use of tobacco, are factors. Throwing out anything of theoretical consideration, the fact remains that cancer of the mouth is more frequent than cancer of the face. Why are cancers in the region of the face and scalp greater in number than cancers of the lower extremities and elsewhere, namely, 535 to 221? First, because the face of all parts of our body, the skin of the face has more congenital residues of cells than any other part of the body. That is one cause. The second is, the face is exposed to sunlight, while the rest of our body is pretty well covered, so that we have here in a large group of figures evidence that there is something else in the etiologic factor of cancer than Cohnheim's theory of a congenital residue, that is, chronic irritation.

When we study specifically, as far as we can, from our records, the 638 cases of cancer of the oral cavity, what one factor stands out first? I have read every single history myself that we have of these 638 cases; I have dictated and redictated them; I have written to the patients to tell me of the things they did not record. I have written to doctors of dead patients and the country doctor perhaps knows a great deal more about his patients than the city doctor, and the one thing that stands out in these 638 cases of cancer of the mouth is neglected teeth. In the great majority of cases—I should say 60 per cent of the cases—dentistry is conspicuous by its absence. I cannot give you the exact figures, but very few of these cases have really been supervised by a good dentist. That is very important. It seems to me, that is very essential evidence to give us hope that the problem of cancer of the mouth is the problem of education of the public in regard to cleanliness and good dentistry. I have written this, and I believe I have the evidence to support it, "Apparently it is as important to the health of the adult to keep the mouth clean and the teeth in good order as it is to the infant to be fed with clean pasteurized milk." Now, if we could say that dentistry can prevent cancer of the mouth, it would be such a simple message that I doubt if we could get the public press to give it the same publicity as if I made the statement tonight that the juice of an orange would cure cancer.

The next prominent etiological factor—and I am not making a crusade against tobacco or alcohol, but it is evidence that we must consider—in cancer of the mouth is smoking. Perhaps it is not smoking alone. I got the impression that smokers, as a rule, are less cleanly in their mouths than those who do not smoke, and perhaps if the smokers had the same oral hygiene there would be less cancer, but the fact remains, nevertheless, that smoking is a very common factor, because why is it that cancer of the mouth is chiefly a disease of man, irrespective of whether you know they smoke or not? Why should cancer of the mouth be chiefly a disease of man? You may say men are less particular about their teeth than women. Among these 167 cases of lesions of the tongue, benign or malignant, there were but four women. Of course, as Hoffman, the great statistician says, you must have very large figures in order to eliminate errors, and that is not a very large figure, and I have not been able to get statistics from other clinics because they are not published in the same accurate way; but in these 25 years, in a clinic that gets most of its patients from a tobacco region, there are only four women, and three of these used snuff. To show you the difficulty of getting accurate records, one of these women I presented to Dr. Halstead's clinic one day, and he asked me to take his clinic for him. There was a five-page history in which nothing was forgotten. The statement was made and written that the woman said she did not use tobacco; she did not smoke; she did not chew, but when I looked into her mouth there was a tobacco mouth; there was leukoplakia and I said to her, "You must use tobacco." She replied, "I do not use tobacco." Her family doctor was there and he said, "Sally, you have been using snuff for thirty years." "Of course," she replied, "I have used snuff." There were traces and evidences of snuff in the mouth. The snuff dropped down between the tongue and the floor of the mouth, and where the snuff dropped, right in that space was the cancer. You will be glad to know that she is one of our cured cases. It was an early case.

Among the 163 males, with cancer of the tongue or some other lesion, there is a statement in six histories that they did not use tobacco. Therefore, we have seen cancer of the tongue six times in men who did not use tobacco. One of these men is living today, or the one that I know is living today, I saw him recently, and he admitted that he smoked up until two years when he came into the clinic, but when they asked him whether he had used tobacco he said, "No," he was not using it then.

Among 117 cases of cancer of the oral cavity, confining it to the mucous membrane of the gum and mucous membrane of the cheek, and in a few cases of the hard palate, that is, not of the tongue or floor of the mouth, there are 18 women, and in none of these histories is it stated whether they used tobacco or not. So I cannot say. Of the remaining 99 men, in but three cases it is positively stated they did not use tobacco. In over 70 it is positively stated that they did use tobacco, and the young men who have been helping me in preparing this work told me by telephone as I left for Chicago that they had received six more letters stating they had heard from the individuals that they did use tobacco. To me, that is a very important point as showing the importance of a positive statement, the statement being whether they did or did not use tobacco cannot be taken as evidence that they did not. I make this statement because Williams, who has written a splendid book on the Natural History of Cancer, states emphatically that his evidence showed that there is no relation between cancer of the mouth and tobacco.

Among the 276 cases of cancer of the lower lip, the figures are about the same as for the tongue.

What do we mean by preexisting lesion? I have changed the term of preexisting lesion because some of my academic colleagues in pathology have objected to the word precancerous. Now, if we use the word preexisting lesion, no one can object because we do not say what it is. By preexisting lesion, I mean a local area in the skin or mucous membrane, attention to which is called in some way so that the individual knows it is there.

When we go over these cases of cancer of the gum, of the mucous membrane of the teeth and hard palate, to which I am going to call your attention briefly tonight, as there is not time to go over the tongue and lip, the tongue and lip are simpler probably than the gum, the most difficult problem is the gum. There are 25 warts, 12 warned of leukoplakia, white patches, 9 warned of definite tumors, 6 with unhealed sinuses, and 5 with scars from biting themselves, in which the lesion had been present for a year, a perfectly definite lesion, that anyone would know, the wart, the white patch, the little nodule, the sinus, and an unhealed scar, making 67 cases. Then there are 16 cases of lesions of the gum and the mucous membrane in which the lesion has been present for more than a year. There are 6 cases of chronic irritation in which the lesion has been present more than a year. So of these 117 cases, in 80 the patients were warned by a preexisting lesion of a definite character that any one, no matter how ignorant, could be educated to appreciated. The lesion was present for months and sometimes years before there was any change, this lesion being easily removable locally. Eighty out of 117 cases of cancer of the oral cavity could therefore have been cured by education in good dentistry. It leaves 32 cases in which the lesions are more or less obscure of less than six months duration on the gum and cheek, and a few very obscure cases clinically, like osteomyelitis of the lower jaw, and only one case among these 117 individuals in which the patient came to the clinic for involvement of glands of the neck and did not know he had anything in the mouth. I can see that mouth now. This patient chewed tobacco; he slept with a plug of tobacco in his mouth. He smoked. His teeth were ragged, the roots of his teeth were in bad condition, and his mouth was in such a foul state that I do not believe he could appreciate it if the entire mouth had been an ulcer. He came with involvement of the glands of the neck and hopeless cancer, so in only one case, and that a very ignorant and dirty individual, was the first warning due to metastasis. In only 31 cases was it of short duration, say six months or more. So you can see the problem of cancer of the mouth is not a problem of major surgery, but a problem of education. It is a human problem.

I am afraid you will be disappointed in my address because it is so very simple. I did not realize until recently cancer of the mouth was such a preventable disease.

I will first demonstrate some benign warts, operated when benign, and some malignant warts operated, some malignant tumors that began as warts.

Slide 1. This is a simple benign wart on the gum in a male who smoked. Around the teeth was incrustation. Irritation of a tooth had produced hypertrophy of the gum. It was excised with the cautery, studied microscopically and found to be benign. Nothing more was done. It was present about a year. There has not been any recurrence since the operation, which was done eleven years ago.

Slide 2. This wart did not look unlike the other wart; it was on the gum; it was present three months and back of a decayed tooth, encrusted, and was in a male who smoked and chewed tobacco. It was removed with the cautery, and you might say he might have given one not experienced with epithelial overgrowths some doubt or more concern as to the question of early malignancy than the other, but there has been no recurrence since 1902.

Slide 3. These two are on the gum. You will notice the nodule. Here you can see the mucous membrane and a definite nodule which any one can appreciate. I do not know whether that should be placed with tumors rather than warts or not, but the patient called it a wart, and if the patient called it a wart it was the thing the patient thought was a wart, and it did have a little rough surface. The patient was a male; he had observed this for two months, and it was opposite a ragged tooth, where the tooth had scratched this part very much the same as a corn. You can see the tumor. I have not a microscopic picture of it. The reason is the sections all faded and I could not get the cell throughout the granulation tissue. There remain little epithelial down growths without pearly bodies, and the cells are chiefly of the cuboidal type. You can see it has been given a good margin. The operation was done in 1910; the patient has been well seven years. You might say from some of these cells down here (indicating) it is cancer. If it is, it is early cancer, and whenever pathologists differ as to whether it is cancer or not, the patient does not differ; they remain well.

Slide 4. In this case you can see the warty surface and the section. That is the way it looks. If you cannot recognize it, it is because you are not accustomed to looking at it. I tell my students that they do not take a microscope to the market to get liver or bacon, and if you investigate tumors in the right way, you will find, as a rule, you can recognize them in the gross much as you recognize liver and bacon in the gross. When you look at them microscopically, you are less apt to recognize them, especially in the early stage. Here is a microscopic picture of this wart which is on the cheek opposite a ragged tooth in a man who smoked, and you see it is nothing but a hypertrophy of the epithelium. Here are down growths which have something to do with the beginning of cancer. That brings up the important point, we do not know why or when cancer develops. For instance, I have made careful investigation of a burn on the lip. We have little burns on the lip which are histologically benign and we have removed them anywhere from one month to three years after their existence. We have had patients come to us with cancer of the lip who told us that they had simply a little burn that was quiescent for three months to six years. Why in one of them does cancer develop within three months and in another individual a burn remains quiescent for six years? We do not know. The same is true everywhere. A patient may have symptoms of gastric ulcer for ten years and then come under observation with cancer. A woman may have a lump in her breast for twenty years without giving much, if any, trouble. We do not know when or why cancer develops; but any one knows that the removal of a wart is a very simple procedure. This individual had a wart on the gum of the upper jaw for two years; gradually there was an opportunity and it then began to grow and it has been growing for three months. Some one had curetted it before the patient came under surgical care, and that may have had something to do with its rapid growth. Here you see the warty growth and the down growth into the tissue, and here is the high power showing cancer growing from the wart until it had invaded the antrum. In this case it was inoperable. It illustrates a preventable lesion, a wart on the gum of the upper jaw in a male who had bad teeth and smoked for two years. There was no change until a few months ago. It seems to me, we can say with truth the removal of that wart, when it was present a short time, would have prevented cancer in this case.

Here you see an epitheliomatous growth in a woman who had very bad teeth in the upper jaw. She was sent to me by Dr. Course, of Newport News, who told me she had a wart for many years on the upper jaw. A small piece was cut out for diagnosis and the tumor diagnosed as benign. It was curetted, and when the patient came under my observation she was in such a condition that since the first piece was cut out the wart began to grow over the entire border of the upper jaw and invaded the antrum. It was not operable.

This is a recent case of mine. The man is apparently well. There is no reason why we should have such a mutilating operation. He had a small wart inside of the mouth at this point (indicating) which you could not see externally. For two years he had diabetes; his doctor was treating him for it, and patient knew he had the wart and said nothing about it until it became visible and his wife objected to the appearance. Here is a point of interest: a man with diabetes thinks that he does better under under his own diet than any diet which any doctor had given him. He was doing perfectly well under his own diet, and when the doctor put him on the Allen treatment he almost had coma, and then when he was put back on his own diet, we operated on him under cocain. Here you see the area cut out. We used the cautery in this case.

Here is the wart projecting from the mucous membrane, and here it is split. You see the mucous membrane and the wart, and here is a picture of a section of the skin and mucous membrane. You notice the overgrowth and a growth extending onto the cheek between the skin and mucous membrane. Here you observe beneath what looked in the growth and under the microscope as perfectly benign cancer cells growing into the chronic inflammatory tissue walling off the warts. The operation was done under novocain and consisted in taking out a V-shaped piece of the angle of the mouth and mucous membrane with the cautery., The operation was done about ten months ago and there has been no recurrence. It seems to me, that an individual should never die of cancer of the mouth from a wart. The next group I show you will be cases of leukoplakia. I have only one case of benign leukoplakia that I have operated upon, but my pathological friends tell me it is cancer. This was done in 1914, now two and one-half years since the operation was done, and the patient is well. In showing this section I cannot refrain from making the remark that this gentleman has helped our investigation since I operated on him by giving us $1,000 a year. I did not ask him for any money, but he was so pleased to be cured of what his nephew thought was cancer by having one tooth extracted and the area burnt, that he has contributed to our cause since. One day, when he came to Baltimore and went into my laboratory and saw the young men working on the cancer problem, he asked me about it and sent me a check for $1,000 and has continued to do so since every year. He was a smoker; he had pretty good teeth, and kept them in a better condition than most people. He went to a dentist. The last molar had been extracted many years before, but there was a pocket behind this molar where the mucous membrane was more difficult to keep clean, and that was the only side in his mouth where he had a white patch behind the last molar. The patch was not larger than a bean, but the reason I operated on him was it seemed to be a little bit elevated as if about to start to increase in size. It was not a smooth patch. We extracted the tooth and burnt out the area with the cautery. The operation was done under novocain, and here you see a microscopic picture.

I have not taken enough sections of benign leukoplakia because I feel the best thing to do is to leave them alone. I have a few sections of one case and there is a perfectly smooth mucous membrane.

Here is the case of a man, 64 years of age. He smokes. His teeth are kept in fair condition, and for four years he has known that he has had a white patch just within the cheek at the angle of the mouth on the left side. He had a Wassermann reaction plus. He had an aneurysm of the arch of the aorta, making him a bad operative risk. I do not know when he went to a dentist first, but six months before he came under surgical care he went to a dentist with his white patch, and a good dentist. This dentist saw the white patch because two months later he told me he saw it. He said nothing to the patient about stopping smoking. He worked in the mouth, irritating this white patch in doing bridge work. Immediately the white patch began to grow; the patient then consulted his physician who treated him for syphilis. Six weeks before I saw him the glands of the neck were involved. Surely, there was a period in which this could have been removed with a hundred per cent chances of cure. The man had this area removed. Here is the ulcer that developed the white patch. You will notice the mucous membrane around it, and here is the mass attached to the cheek. He had the glands of the neck on both sides removed. He stood the operation well and died of cancer in one year.

Here is a microscopic photograph of cancer developing in that white patch. Here you see the mucous membrane and there the cancer. I am glad this slide shows it so well. This is the usual picture of the mucous membrane over the white patch. The epithelial overgrowths are absent and you have a smooth zone of not only epithelium but granulation tissues. But here you notice there has been an overgrowth of epithelium not shown in the section, and here is the down growth and pearly body formation. He has had no recurrence of the growth in the neck, although every gland on both sides of the neck was microscopically cancerous. He died from hemorrhage of cancer. The story in this and other similar cases is simply this, that usually the dentist is not educated, the doctor is not educated, and the individual is not educated, and in this case there were a number of dentists and a number of doctors who needed to know the message we are giving tonight.

The reason I bring this picture in is that it shows a method of removing cancer of the gum, as I believe it is far ahead of the older method of resection when the bone is not extensively involved. I will show you pictures first, then tell you the story. This is after the operation, one year after his teeth were extracted at the operation, and the whole zone of disease was about the size of a 25-cent piece. The whole zone from the junction with the soft palate to probably the cuspid tooth was burned with cautery, so that the bone was exposed, and probably this large piece of separated bone is a sequestrum. Notice the piece of bone that is separated. That was cancer. The only evidence I have that it was cancer is this: a section was removed by a colleague of mine in New York for diagnostic purposes and was pronounced cancer. The area was so small that there was no desire to destroy it. I destroyed everything for microscopic appearance. These are the teeth taken out a few weeks before and I believe myself it is cancer. You will notice the pearly body formation to which I have called your attention previously, and here are the irregular cells and there is beginning pearly body formation. No pathologist has differed with me as to its being cancer. There was no metastases of the gland.

What is the story in this case? The man had been warned for 20 years. His mouth was foul; he had white patches, although it was four years since he stopped smoking. Near a tooth on the lower jaw, probably the first molar, there was a larger white patch than in any other portion of the mouth, and a colleague of mine burnt it with cautery.

I want to leave this impression with you: I believe that when there is nothing but a white patch, the best thing to do—and I have had experience now with over 26 cases—is to leave the white patch alone and urge the patient to stop smoking and to keep the mouth clean. If you are going to attack a white patch with cautery, attack it as you would cancer. Any superficial burning, any application of any irritant, unless it destroys the entire area, is dangerous. Whether this man had cancer when the cautery was employed I do not know, but if he had cancer it was a period in which cancer could have been cured because I have cured much larger areas with the cautery. Then he had a tooth extracted and the dentist cut out a piece with a knife. Never use a knife to cut out a piece for diagnostic purposes if you can use the cautery, and never cut out a piece for diagnosis unless it is essential to save the patient from a mutilating operation, which was necessary in this case. But it should have been done with cautery, and a frozen section made at once, so that operation should have followed at once. This piece was cut out five minutes before I saw it. You can see this man could have been cured by stopping smoking 19 years ago. A very remarkable thing has happened. He still has leukoplakia in his mouth; he has stopped smoking, but on the lower jaw there was a white patch which extended down to a scar from the cheek. When he came to me with the white patch, I found it could be picked off like a scab, and I felt that was the patch to operate upon. So the area was burned wtih cautery; I made a diagnosis of cancer, which was verified microscopically, with the result I would not have to burn again and the mutilating operation was slight.

Here is a piece of tissue stained of what we could get that was left. You will notice the scar tissue on the gum. You see the pearly bodies that are microscopically cancer, and what I show you now is normal scar tissue. But this zone here is cancer coming down to this point, giving a good margin here with scar tissue. Here under high power you have definite cells and pearly body formation. That is not a recurrence because that white patch was there when I operated. He has a hundred more of white patches still unhealed, but this white patch was drawn down by the breaking of the scar until it came over the bone and only recently had it changed. He confessed to me after the operation that my good friend, his dentist, watchful in regard to leukoplakia, had been treating that white patch with acetic acid, the only one that had been treated. I wish I had more evidence, because my experience teaches me the truth of the statement I have given you. I cannot go into the details about cells, but this is a beautiful picture of scar tissue from the gum and the peculiarities of the mucous membrane of the healed and other interesting histological features are well shown. I believe that we have done enough in that case. A little piece of bone sloughed. It has now healed.

We worried about the persistence of these leukoplakias after these patients stopped smoking. I do not know anything for it. Yesterday, for the first time, I saw a man whose tongue was clean, and it was four years since he stopped smoking when I first made the observation. That may be slow in cleaning up. When you are suspicious of a white patch, treat it as a cancer, and the cautery is the thing to use.

Here you see the open mouth, the position of the molar tooth, and the fungous cancer. No one would think of taking a piece out of that for diagnosis. If he did, no matter how good a surgeon he is or was, he should not operate. He should know that is cancer, and one does not need a microscopic picture. This man was warned about a white patch for six years. His teeth were extracted because they were decayed; all the rest of his teeth were bad. He had a dirty mouth; he never went to a dentist except to have his teeth extracted. He smoked and chewed for ten months; a white patch developed, and this white patch had been curetted and partially cut out by the knife, so that after he came to us he had apparently a curable cancer when we burnt it out with cautery. It did not extend into the bone but extended down behind the tonsil. I burned out the tonsil region as much as I dared burn it without burning the carotid artery. One must stop at the carotid artery with the cautery. The man died of recurrence. I feel positive that this man could have been taken at a stage when he could have been cured by stopping smoking and the application of the cautery.

The next slide shows the method of attack by novocain. An incision is made in the cheek preliminary to splitting under novocain. Here you see the cheek is split and you can see the growth exposed. We do not inject into the growth, but under the mucous membrane at a long distance from the growth. I have done a sufficient number of cases under novocain to know that in those cases in which we have not accomplished a cure are not due to novocain. I do not believe, if you know how to use novocain, you will have very many unsuccessful results. The teeth were extracted and the whole area was burned to the bone and we found infiltration behind the tonsil and did everything we could have done even if the man had been under general anesthesia. It was burned six times, but we never succeeded in arresting the growth.

This is another picture. That looks like a terrible thing, but when the operation was over what you see is a little line in the face. It is one of the best ways of getting at this part of the growth, that is, splitting the cheek. In these early cases I did not like to burn away back there without splitting the cheek and it has not left much of a scar.

I am now going to show you a case or two which illustrate the difference between the educated individual who recognizes a preexisting lesion and the man who has not this information. This patient is a colleague of mine. When he felt this little tumor in his cheek he waited three months, then came to the operating room one day, and we cut it out under cocain anesthesia. He told me that he lost about two hours from his practice. Here is a microscopic picture. You can see this leukoplakia. This man smoked; his teeth were in very good order, but at the point of this nodule he bit himself three months ago, after which this nodule became larger and larger. It is covered with mucous membrane and the mucous membrane is not a temporary overgrowth as it is here. This is chronic inflammatory tissue, then normal tissue. Here is one edge. You can see the down growth. You can see how easily it is possible to have removed this soon after it had taken place, but we do not know when or why they occur. You can see how cancer in this man could have developed from that nodule. If I do not show you any more than these two pictures it will be all that is necessary. This man told me he rolled under his tongue a little pellet of tobacco for fifteen years. He did not believe there was anything wrong about it, and one year ago it stopped rolling, that is, he could not roll it around; he became afraid and pimples formed in his cheek, then he became interested and his doctor became interested and he came for surgery. He was in the hospital three weeks. We split the entire cheek, took out the involved glands of the neck which did not show metastasis. Here is the piece we burnt out with the cautery from the cheek. Here is a section which looks like adenocarcinoma from one of the labial glands. The operation was done nine months ago. I saw the patient a few days ago, and there is no recurrence so far, but that means nothing. Here is a case that illustrates extensive surgery, such as resection of the upper and lower jaws, a very wonderful piece of operative work, difficult anesthesia, difficult manipulation, hemorrhage may be, and the requiring of a careful plastic and often with a great deal of mutilation. The operative mortality in recent years has been reduced to a minimum with better anesthesia and better surgery; but the results are not much better if surgeons will consider all their cases. We rarely ever go to a clinic that a surgeon does not show a cure in a case of this kind, but he does not say anything about how many that represents, and a most enthusiastic statement would be five per cent of these miraculous cures. This man was operated in 1907; he had a lump on his cheek for six years similar to the other two shown. It was in the form of an ulcer for six months. He was operated on by Dr. Finney in 1907, who removed the entire lower jaw with the tumor and glands of the neck. The glands of the neck did not show metastasis in any of the sections sent to me. He remained perfectly well for seven years. Dr. Finey could have reported him as a cure up to six years and eleven and one-half months. Then he returned with some glands of the neck that were cancer and died of cancer. This is one of our sections we have of the original tumor. We have another picture which shows the fully developed cancer. Here is an important point: I do not like to put down on the written records cancer as positive proof unless it was cancer. You must have the original tissue in section to restudy again and again. We have restudied and found it was not cancer we had cured. I do not think any one will disagree as to that being cancer. This brings up the question of gum boil.

In 19 cases the patients stated that the first thing they observed was a gum boil. Gentlemen, you know much more about gum boils than I do. Besides, you see these things, although they do not develop into cancer, so I do not believe I am going to be able to tell you how to differentiate between an innocent gum boil and a gum boil that is the first sign of cancer. But in 19 cases the patients stated they had a gum boil, and in every one of this number it was treated as a gum boil; it was cut into with a knife. In every one of these cases the condition of the teeth was sufficient to give rise to a gum boil.

Another thing that may not be helpful: most of them were men and smokers, but in 16 cases the gum boil had been first observed for more than a year. In the remaining cases less than 6 months. In many of the cases when the gum boil was cut into, pus came out. Of these 19 cases of cancer which had developed from gum boils, there is one definite cure, two doubtful cures, the patients dying before five years without evidence of recurrence. There are 7 cases that were inoperable. That is a demonstration that when you see a gum boil, it is much safer for a patient to think it may be something else, and in your treatment of that gum boil you should first exclude the possibility of cancer because the method of excluding the possibility of cancer is not bad for a gum boil that is not cancer, and I believe in the future every dentist will have in his operating room or office an electric needle that will open a gum boil just as well as a knife and will allow him with the needle to cut out a piece for diagnosis. Of course, this is prophecy; I have no facts as yet.

I have never been asked to see an innocent gum boil. Perhaps some of you in the discussion will be able to tell me. Here are 19 cases of cancer of which there is but one definite cure, and 7 inoperable, that began as gum boils. This patient is one of Dr. MacCallum's father, Professor of Pathology in New York, and Dr. MacCallum was a practicing physician and has sent to the Johns Hopkins a good many cases. He traces his cases very carefully. I heard from him a few days ago and he tells me that the man is still living, so that there is no question as to a cure.

This slide shows the case of a male, 62 years of age, a farmer by occupation, a smoker, who, six and one-half months before admission, noticed what he called a pimple on the inner side of the gum of the lower jaw. It grew rapidly and was cauterized by his physician. When he came under our observation he had a typical ulcer that you could make the diagnosis from the gross appearance, covering the alveolar border of the lower jaw from the first molar to the last, extending across the floor of the mouth and not involving the tongue. It was a nodular, elevated growth. We have the original sections from which it was taken, and one gland shows metastasis. Operation consisted of resection of the entire right lower jaw, the floor of the mouth, base of the tongue, and glands of the neck in one piece. The operation was done by Dr. James Mitchell, resident surgeon of the Johns Hopkins Hospital in 1889 and it was the first mouth operation he ever did. We find in Baltimore we can teach our young men to do surgery quicker, and with less difficulty than to make a diagnosis. I do not know what Dr. Mitchell would have done if he had seen the man with a gum boil. His training better fitted him for resection of the jaw, as most surgeons today are, than for the differential diagnosis of a gum boil.

The next case I will show you is a recent one. Here you see a fungous tumor. It is a typical cancer and here is a piece of bone not killed by the cautery, but necrotic under this cancer. This patient told us that he had no trouble until one month before operation, when he noticed in the region of a molar tooth on the right lower jaw a thing that he called a gum boil. He immediately consulted a physician who extracted the stump of a tooth; therefore, he did not have good teeth, and as that did not help him he consulted another physician in the same town who treated it with iodin. I think you will agree with me that one thing any dentist can do is to pull teeth, and one thing any doctor can do is to put iodin on it. What this man's chances are to burn out the growth with the cautery I do not know.

Here is a section which is rather interesting to observe. The growth involves the mucous membrane. Here you notice the normal mucous membrane, and you can see how cancer may extend under an apparently normal mucous membrane, demonstrating the importance of giving an apparently small ulcer or fungous a wide margin. In this case the operation was done in October, 1910, by the resident surgeon of the Johns Hopkins Hospital, and the patient is well. But there is something about this mouth which made me feel that this lesion was unnecessary. The man had never been to a dentist except to have teeth extracted and his mouth was filled with carious teeth and stumps of teeth, and this is what we did for him at the Johns Hopkins, showing that surgical clinics are not up-to-date. We treated his cancer and sent him home with his bad teeth. Fortunately, I had written the man, in spite of the fact that we have at the Johns Hopkins a splendid dental clinic on the first floor (three floors below the operating room) so that there was no difficulty. But every surgeon is so interested in the treatment of cancer that he pays no attention to the part of the mouth that was not cancer.

This is the scar of an attempt to cure a cancer of the upper jaw in a man that started in this region. It is one of my own cases and it has taught me a lesson. Here is a remarkable thing: the man had extensive involvement of the glands of the neck. You can do as much as you like in the dissection of the glands of the neck, and there is no mutilation, but when you come to operate on the upper jaw, every centimeter you take increases the mutilation, so that unconsciously the surgeon's hand in a case of this kind is more or less hampered in its work. He takes a little less than down in the neck; he can take a little more and never do any harm. The point of recurrence in this case was not in the scar at all, but a growth up under the chin, and here I operated again and again, using the cautery, but did not accomplish a cure. The man lived three years. He had a bad tooth and about this tooth an ulcer formed on the gum about the size of a ten-cent piece. The tooth was extracted, and a piece of tissue around it taken away and no examination made by the dentist. The piece was excised by a student and sent to me and diagnosed as cancer. I wrote him what would have to be done. The patient refused local excision, and it recurred, so there was a piece taken out by the dentist and by the doctor, and a local operation done with the knife and not with the cautery, and then followed local recurrence.

Here is what I removed. You can see here a criticism of good surgery. As I approached the disease my limits of dissection grew smaller instead of larger. Perhaps if I had removed the mass in the upper jaw, and did as good operation on the upper jaw as I did on the glands, we might have saved him. It seemed a little ulcer. You see, I have given a good margin, and this operation was done with the cautery. But, as I have said, there were two pieces cut out, a local operation was done, so it has undoubtedly disseminated. That a part does not heal over is not a sign of cure, whether it heals under X-ray, radium, paste or cautery, or if it is excised with the knife. You may have perfect healing over, and on another occasion I have shown sections of scars after healing over has taken place with all these things with cancer under the scar tissue. There must have been under the scar tissue foci of cancer which I did not remove.

I show this case to you to demonstrate that resection of the jaw, which we previously did, is unnecessary in the early forms of cancer of the gum because the bone involvement here is superficial, and with the cautery we can get rid of all involved bone without destroying the continuity of the bone and accomplish a cure with just as much success as with resection.

I show you a case of cancer of the jaw in which the jaw was considerably involved, and the man has remained well since operation, but died three years later of pneumonia, with no signs of recurrence, but a mutilated individual. In that case I should have used the cautery instead of resecting the jaw.

Here is a case I had some correspondence about recently. Dr. Ochsner operated some time ago in which he used the cautery for extensive carcinoma of the lower jaw, removing it with the cautery thoroughly as well as a piece of bone, and the man at the present time is apparently well.

Here is a section of this last case. There is no question as to its being cancer. He remained well three years and died of other causes, but we do not know whether he had been cured. Here is the skin and there is the ulcer. If I turned that over you could see some disease on the other side and the mucous membrane. It began as an ulcer on the cheek two years and eight months ago. You can see that woman could have been cured without the use of a huge mutilating operation, but this is the result.

I dislike to show pictures illustrating mutilating operations, but this is a cancer of ignorance. I remember going to St. Louis in 1910 and showing a few slides I had of cancer, preexisting disease, and they showed pictures of cancer at the Cancer Hospital in St. Louis, and these were the pictures they showed.

Here is what we tried to do with the cautery to make the patient comfortable. Here is the picture. I might say for the treatment of cancer I have been working as many as three cauteries sometimes at one time, and in that stage I seemed to have accomplished a great deal with the newer methods of operation. At any rate, I have not killed any of the patients in the hospital. A good many of them are taken from the hospital dead under other methods of treatment. But I do not know of having accomplished a cure. These are simply attempts to show what we can do with burning where we fail with the knife. Nor do I know of any authentic cases of cancer of that kind cured with anything else. I will tell you where the evidence comes where cancer of that kind has been cured with something else. We have a case similar that that almost recorded in the hospital as a cure, and I had a letter a few weeks ago from a physician saying that the patient is not dead but is in a sanitarium getting over the morphine habit five years after our operation. I restudied the case and found that there was not one evidence of cancer in the area resected, that is, the cheek, the lower jaw, and the glands of the neck. It was a case of osteomyelitis that was necessarily limited and looked like cancer. He would have been cured if he had radium or X-ray applied, or if left alone the bone would have sloughed out. He suffered from scar pain and took morphine.

The next case was operated on eight years ago. He had a scar in his mouth on the lower jaw from biting his cheek. He smoked and chewed. He had it for four and one-half years and it never healed. He had an abscess which had been incised over three months. The operation done consisted of resection of the entire lower jaw, the floor of the jaw, and glands of the neck. These glands did not show metastasis. Here is the specimen removed. Unfortunately I have not a slide of it, but there is no question as to its being cancer. It is eight years since the operation was done, so you see that there are a few cures from extensive cancer, but these are so few that it is questionable whether it is worth while. No surgeon should refuse to make an attempt to cure cancer in any stage with any method or with anything and even if you do get a few cures, you must not let them in your enthusiasm make you believe and make other people believe it is a cure for cancer, when we know only a very small per cent of the cases are curable.

I want to leave the impression in your minds that in the past surgeons have exaggerated their operative cures for cancer, not purposely, but because they were anxious to show surgery would cure cancer, because if an individual waits for cancer to develop, in at least one-half of the cases it becomes inoperable. Of the operable cases, at the very best one-half are cured, so that the very best possible record has shown in the breast and lip 25 per cent of cures. Recently we have increased our percentage of cures by placing among the cured cases of cancer lesions that are histologically doubtful, and I have submitted fifty specimens from such lesions to pathologists of the country from the breast in which there has been a difference of opinion as to whether they are cancer or not. The results in that group are 100 per cent. That group should be considered by itself.

I have simply shown what you can do with preexisting lesions, and I believe that cancer of the oral cavity in a large percentage of cases is a preventable disease. In a small percentage of cases it can be recognized in time to cure it without mutilation, and in a very small percentage of cases of these quiet, insidious cancers, I doubt if surgery will accomplish a cure, those that come under the head of osteomyelitis.

I thank you very much for the marked attention with which you have listened to me. (Applause.)

THE PREPARATION OF A TOOTH FOR A PORCELAIN VENEER CROWN*

BY DR. ADOLPH E. SCHNEIDER, CHICAGO, ILL.

THE REQUIREMENTS—A PRACTICAL THEORY

What, with a patient before you for the insertion of a porcelain veneer crown, is the first consideration? Is it not the same as an architect or builder would have, namely, whether the work in mind will be a success upon the foundation that presents?

What are the requirements that determine this? To begin with, is it necessary, just because of the placement of a porcelain veneer crown, that we devitalize? Most assuredly not, unless the requirements presenting would call for the destruction of the pulp in any event.

But—if a cement filling or capping would preserve the pulp, always save it, and go ahead with the preparation of your tooth for a porcelain veneer crown.

I have no complete record at hand of all the porcelain veneer crowns that I have placed in the mouths of my patients, but it must run into the hundreds in the last eight years, for I insist on the placement of this crown whenever the patient can afford it; and never, to my knowledge,—and I have taken a great many skiagraphs after these crowns have been worn a year and over,—have I had any pulp dying or giving any sort of trouble.

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*Read before the Kenwood Dental Society, Oct. 3, 1916.

Furthermore, in those cases where after a time I wished to improve the contour or color, or where there has been an accident, I have invariably found the teeth just as sensitive as when I first prepared them.

So, judging from my experience, I firmly believe it bad practice to destroy the pulp in order to place a porcelain veneer crown.

It is, then, necessary to note the position of the tooth relative to the adjoining teeth, and also of its incising or occluding opposite, so as to determine the *directional stress* applied when this tooth is in use, for upon this one point more failures are brought about than any other, I firmly believe. The reason for this I will state later, when I explain the reason for preparing a tooth in the only way in which a tooth should be prepared, if one expects to attain the greatest efficiency from this type of work.

The crown must bear the least possible strain of the destructive directional force in attrition, bearing in mind at the same time the stresses the root must withstand so that it will keep its proper alignment in the dental arch and functionate correctly.

Having noted the above facts, it will then be necessary to consider the proper shades or coloring of the teeth in the mouth and to note the color of the hair, eyes, skin, lips and the amount of light reflected into the mouth and from within out.

All the above notations tend to determine, usually, the coloring of the individual's teeth, for they join in nature's harmonious scheme of coloring. Yet without proper attention to contour, with the coloring correct, the finished product would seldom blend correctly with the rest of the teeth. Again, with the coloring a trifle off and the contour correct, there is a harmonious relationship that blends much better than where the color is correct and the contour incorrect.

The next consideration is the preparation of the tooth. This is the step that has determined me to call this crown a *Porcelain veneer crown;* not because "Porcelain Jacket" is not appropriate, but to call the attention of the profession to the fact that, heretofore, no *scientific* form of preparation has ever been determined upon, resulting in a more or less weakened finished product.

About the only conception the profession generally has of the prepared tooth for this work is that it has a shoulder at the gingival located anywhere about the gum margin and a peg-shaped or cone-shaped coronal portion.

I wish to state here that, outside of the natural strength of the porcelain itself, the reason so many jacket crowns are a success is the fact that, unconsciously, the operator has given the correct or nearly correct form to the remaining root structure.

In the *correct* preparation *every line* of the preparation is a *desired strength feature* of the finished whole. Mechanical principles hold true here just as well as in any other mechanical structure. Every plane of the preparation takes care of some one of the applied attritional stresses.

Bear in mind that the porcelain itself, although strong enough in some instances to withstand the stresses applied, is not sufficient to make of this work the success that it is possible if the correct mechanical principles be applied.

In studying this feature, I have always compared the porcelain to the enamel of the tooth. Enamel of itself is no stronger than porcelain, so nature applies true mechanical features to make of it the hardest, toughest resisting substance in the body.

Study the shape and the planes of the dentin underneath the enamel and the direction of the enamel rods if you wish to see how nature has taken care of directional stress as it applies to the resistance of the enamel and the taking care of the tooth itself and its surrounding tissues. As a rule, enamel rods meet the applied stress *end on* with the dentinal planes at right angles to this applied force.

This being so, is it not logical that we prepare our dentinal surfaces so that they do the same? And, if we do this, is it not plain to see that the greater stress is taken up by the prepared tooth itself rather than by the porcelain? Is it not logical to suppose that this added mechanical detail will tend toward an added improvement feature to the accepted preparation of the porcelain jacket crown, making of the porcelain veneer crown a scientific advance worthy of acceptance?

In my experiments I tried out this principle hundreds of times until I could build a crown on a properly prepared spike and, when cemented to place under conditions similar to those in the mouth, drive the crown through a hardwood plank hundreds of times without breaking the crown.

I have one specimen—a central—that has been driven through blocks of wood so many times for the last six years that I have lost track of the number; and I will venture to say that the natural tooth never has to stand one-half of the stress of any one of the blows required to drive the crown through the resinous cedar block that I use in my experiments. Consequently, I feel that it is absolutely essential that the coronal form should simulate the same planes at the dentin under the enamel of the tooth except at the incisal in the six anterior teeth, where, from mesial to distal, we should have a lingually inclined plane at right angles to the applied incisal stress; on the other surfaces rather exaggerate these planes than minimize them.

The shoulder should be square or slightly inclined pulpward, so as to take the applied stress at as nearly right angle as possible; and it should be placed so far under the free gum margin as to free the cement line from any of the numerous chemical reactions that take place in the saliva, for with a correct joint the gums will hug the neck of the porcelain veneer crown tightly.

I am taking the liberty of applying the term "Veneer Cone" to the properly prepared tooth—a "*Reason*" preparation for the reception of the porcelain veneer crown.

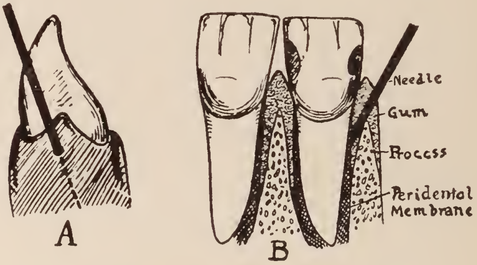
THE APPLICATION OF THE THEORY

We first have to consider the various cases as they present themselves for the application of this crown. Thirty-five per cent of the cases that present will have been already devitalized; forty per cent of the remaining cases, although vital, will not necessitate the application of either a local anesthetic or the use of an analgesic in their preparation; the other twenty-five per cent will necessitate some sort of a benumbing influence.

It is this latter percentage that I will now consider, because the complete technic of this work is involved where teeth are vital. For the last eight years I have applied a local anesthetic to a greater extent than analgesia. I have always applied my solutions to the peridental membrane, using the same preliminary care that is necessary in using a hypodermic for any other dental operation.

I start my needle in the septum of gum between the teeth, expressing a drop of the anesthetic here, then directing the needle to a point where I may force it well up between the alveolus and the root of the tooth; and then, with considerable pressure lasting from five to eight minutes, force the novocain into the tissue. Care must be taken to support the syringe so as not to vibrate it enough to break off the point of the needle. This is done by using a rest with the left hand on the teeth and helping support the instrument in this way.

If this is done, one will get an anesthesia lasting about forty-five minutes with a minimum amount of anesthetic expressed into the tissue, which is to be taken into consideration. The less anesthetic used,—and in this way about all that is necessary is four or five drops of the novocain solution,—the better, for I do not believe it is well to see how much anesthetic—or any foreign substance—we can express into the tissues.



Peridental Anaesthesia

Fig. 1

Fig. 1-A and B will show the direction of the needle in my technique.

We are now ready to grind down the incisal of our tooth. To accomplish this, we use a ⅝-inch rapid cutting stone, about ⅛-inch in thickness, giving to the incisal edge a plane which will receive force of incision at right angles to this applied force. (Fig. 2-A, B and C.) Only grind off incisally to a depth a little more than the dento-enamel junction.

The mesial and distal are removed with a flat safe-sided separating disk, and here one must keep in mind the fact that we must not cut off too much of either side, for we wish only to remove enough to leave the sides slightly tapered after the shoulder is cut. (Fig. 3-A, B and C.)

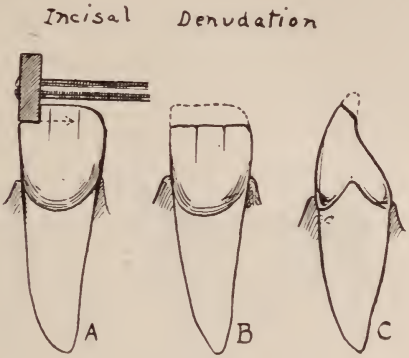


Fig. 2

There is a point here of which I wish to speak in the use of stones in grinding down teeth. Much damage can be done by not keeping our stones and other working instruments *cool* and true. I have a few very fine sponges that I moisten and keep in contact with the stones during the entire grinding operation, and when the steel cutting instruments are used, I employ the compressed air. This will prevent any burning up of the animal matter in the dentinal tubules and lessen pain where anesthetic is not used.

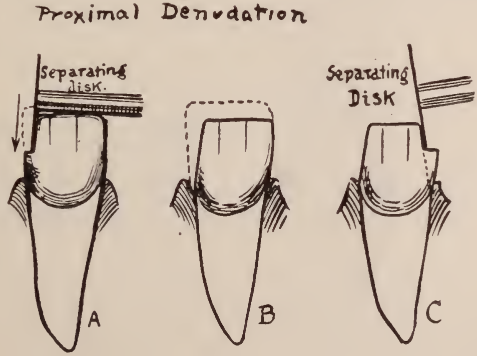


Fig. 3

The labial and lingual are denuded of the enamel with a small flat stone, giving to the tooth the same relative contour that the dentin has under the enamel, except as we accentuate the lingual surface so that the planes will help support the crown against the directional stress applied.

As it is impossible to remove the enamel at the corners with this stone, it is best here to use a taper cone mounted point, and this can also be used to grind off as much as possible the enamel at the gingival border, both labially and lingually. (Fig. 4-A, B and C.) This virtually completes the denudation of the tooth's enamel.

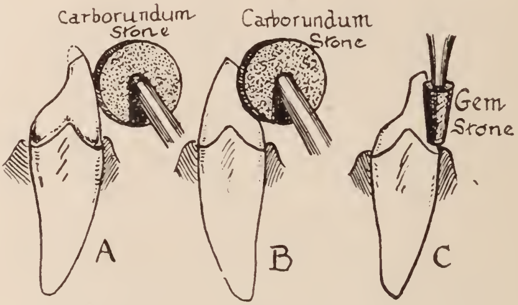


Fig. 4

Fig. 5 (A and B) represent approximately the amount of tooth structure removed from a central in the operations up to this point. It will be noticed here that the angle given the incisal edge, and also the plane of the surface lingually in the middle third of the tooth, are parallel so as to take up the stress of mastication and bear this burden rather than give the tooth too much

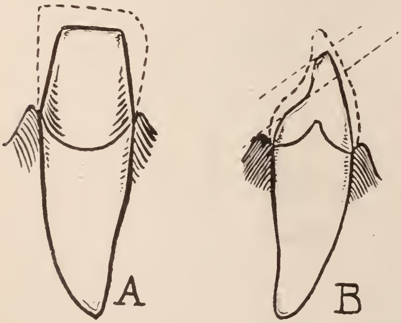


Fig. 5

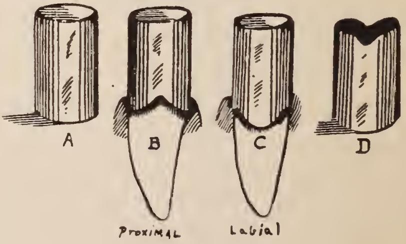


Fig. 6

of a cone preparation and force the porcelain to take up this strain. This is a strength feature that must be taken care of if you wish to attain a maximum of strength in our finished veneer crown.

It is at this point that we fit a seamless copper shell to the tooth, contouring it to fit perfectly at the gingival, so that when the impression is taken the cup will not impinge upon the gingival tissues. This cup should pass as far as possible under the free margin of the gum. (Fig. 6-A, B and C.)

The cup is now removed and filled flush with a good modeling compound. (Fig. 6-D.) The cup is then laid aside until the impression of the prepared veneer cone is necessary.

We are now ready to cut the shoulder into the tooth. For this purpose we use a plain fissure bur—size 57½ and 58 S. S. White Revelation bur. (Fig. 7-A.) Be very careful, in cutting the shoulder, not to force the *point* of the bur into the body of the tooth, which will invariably give you an undercut; but start the cutting at about the middle third of the taper and drive the bur gingivally until the bur is buried in the dentin at that point where we wish our shoulder to be. This gives us a starting point for cutting the shoulder laterally about the tooth. (Fig. 8-A, B and C.)

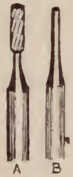


Fig. 7

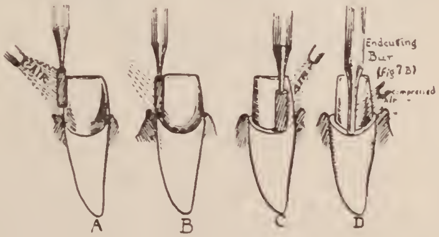


Fig. 8

With the compressed air directed against the tooth about the middle third at an angle of 45 degrees, the free margin of the gum will be forced back enough so that one can see at just what depth one is cutting. This shoulder should be placed at least halfway down under the free margin of the gum; two-thirds the distance is still better.

As a finishing preparation, the end-cutting bur—Friedman Bros.—(Fig. 7-B) is a very handy adjunct, for with it we can deepen our shoulder and also square it without running the danger of an undercut. (Fig. 8-C and D.)

I wish to make an emphatic statement here as regards the placement of the shoulder. Many of the men are placing this shoulder just at the edge of the free margin of the gum, which I feel is decidedly wrong. By having the shoulder as far under the free margin of the gum as possible, we get away from any decided chemical reactions that might take place in the mouth; and if we get a good union of porcelain and tooth structure, we will have a much more healthy, hugging free margin of gum around the crown that will tend to preserve rather than disintegrate our cement margin. Where the shoulder is level with the gum, there is bound to be more or less gum irritation with a resultant recession and consequent unsightliness in a short time after the application of the crown.

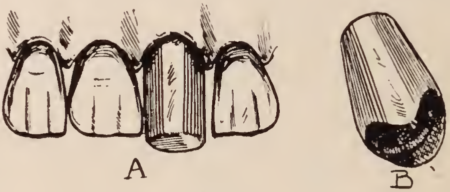


Fig. 9

With the completion of the shoulder preparation, we take up the individual impression taken with the cup. Dry-heat the modeling compound until it is quite soft; touch it to vaseline and force it over the veneer cone. The cup should pass beyond the shoulder so that the imprint is surely accurate. Keep a pressure upon the cup while the compound is hot and chill quickly and thoroughly. Then remove carefully. (Fig. 9-A and B.)

Fig. 10 shows us the relationship of our veneer cone to the adjacent teeth.

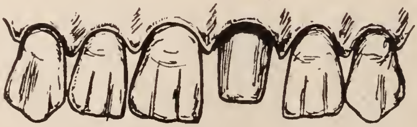


Fig. 10

We are now ready to take as accurate a "mush" bite as possible, and I do this by rolling the S. S. White Extra Touch Pink *Tenax Wax* in a vaselined bridge tray, and while the wax is pliable force it over the prepared tooth; and include in this impression *its counterpart on the opposite side of the arch* so as to have a contour that we can simulate when we get to building up the tooth.

After the wax is pressed up over the teeth, slide the tray off the wax, place your forefinger across the labial surface of the wax, and have the patient bite into it. Your finger should prevent the distortion of at least the labial portion of the wax. Chill the wax thoroughly and remove it with care. (Figs. 11 and 12.)

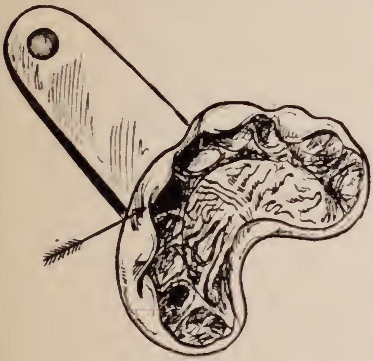


Fig. 11

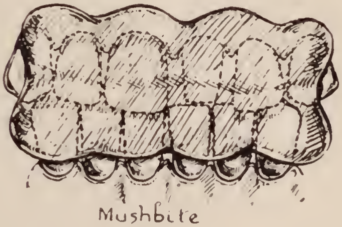


Fig. 12

THE RESTORATION OF THE VENEER CONE

I am so firmly of the opinion that the porcelain veneer crown is applicable anywhere in the mouth where we wish to place an individual crown that I wish to give my method of restoring those cases where other dowel crowns have already been applied, and it will not take much stretching of the imagination to apply this method in all cases, from the split-root restoration to those cases where it is necessary to restore the veneer cone by only so much as a cast filling.

Generally, where a dowel crown is being replaced, we will have the labial portion of the root to be crowned about level with the gum margin labially (Fig. 13-A), and usually higher incisally on the lingual than the gum margin in that area. It behooves us to

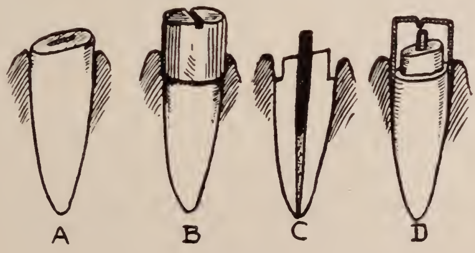


Fig. 13

note whether there is any enamel left on the root; and, if there is, to remove it. Then, with the seamless copper cup, get as accurate an adaptation to the root end as you would to apply a cone. (Fig. 13-B.)

If it is hard to fit the cup accurately, I sometimes use the stick modeling compound, press it over the root firmly, get an imprint of the root, fill in firmly with a good cement, and use this to fit the cup over. This will prevent pain in the fitting of the cup in some difficult cases. Care should be taken to see that this seamless cup, when in position, will not interfere with the closing of the bite. (Fig. 14.) At this time use a separating disk and cut a groove across the incisal end of the cup. (Fig. 13-B.) This is done to determine the position of the cup in the future bite.

It will be noticed that I intend leaving the cup on the end of the root in this case, because in trying to get a wax impression and bite it would be impossible to firmly and accurately place the finished cement or amalgam root in the wax with any degree of longitudinal stability. We must have an imprint that will give us a stable seating when we place the replica of our prepared tooth in the wax bite previous to running up the plaster model.

By taking an imprint with the seamless cup, as in Fig. 13-D and Fig. 14, so that the bite when closed will free the cup,—since the cup is stable on the root,—we have as a base a more reliable chance for an imprint in taking the wax bite (Fig. 15); in fact, just as stable and reliable as the veneer cone of a sound tooth, and one which we can rely upon as affording a stable seat for our amalgam or cement replica of the prepared root.

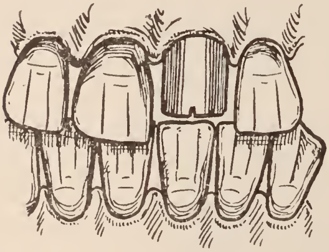


Fig. 14

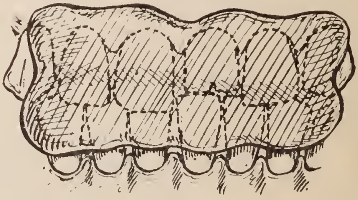


Fig. 15

Having established the reason for cutting the groove in the top of the cup and of shortening it so that it would free the bite;

and having contoured this cup so that it fits the root end under the free margin of the gun as far as possible and as tightly as we can, we will now fill this cup with a high grade modeling compound, packing it in firmly so that there is no possibility of enclosing an air bubble; I then vaseline the compound and lay it aside for subsequent use.

In most of these cases the canal has already been reamed out for a post, but I again clean the canal thoroughly, fit in the permanent post or dowel, remove that and lay it aside until just before taking the cup impression. , We are now ready to cut the shoulder about the root. This is done by directing the compressed air against the tooth so as to blow the free margin of the gum away from the root; and then, with a No. 58 Revelation bur, cutting the shoulder by forcing the bur into the tooth structure and cutting laterally about the circumference of the root until we have a broad square shoulder or butt joint as far as possible under the free gum margin. This shoulder is cut a trifle broader than usual so as to allow us to band the root above the shoulder at the same time as we restore the rest of the cast veneer cone.

Place the dowel at this time into the root canal; dry-heat the modeling compound in the cup until quite soft, and then gently force the cup down over the prepared shoulder until you have an accurate impression of the inside and outside angle about the periphery of your prepared root. After having established the definite outlines of your prepared root in the impression cup, replace it on the root and prepare for the "mush" bite. This is taken exactly as before by placing your Tenax Wax into a clean, vaselined bridge impression tray and forcing it over the teeth and the cup on the prepared root, being sure to include the corresponding tooth on the other side of the arch as a guide in contouring the new porcelain restoration. (Fig. 15.) Slide the tray off laterally without distorting your wax; place your finger along the labial portion of the wax to prevent distortion labially, and allow your patient to bite into the wax. Chill your wax thoroughly and remove carefully. This gives us all the impressions necessary to make up models so that we can restore the body of the tooth in a casting that not only restores to contour the body of the tooth, but at the same time *bands* the weakened root to prevent subsequent splitting under stresses to which it may be subjected under mastication.

Fig. 16 shows in its detail a prepared root for a central, the restored body of the cast veneer cone, and the approximate fitting of the veneer crown over the reconstructed substructure or the *restored* veneer cone.

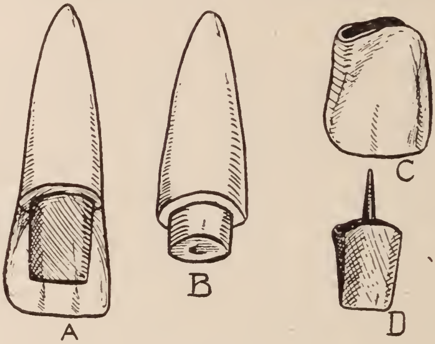


Fig. 16

Fig. 17 is a diagrammatic illustration showing a restored veneer cone for a molar and the relative thicknesses in a transverse section of gold and porcelain on the excised tooth.

VENEER CONE CONTOURS.

Most of my investigations along the lines of strength-giving features as related to the porcelain veneer crown come under this heading. It is so important to me that I wish to impress it thoroughly upon the minds of those doing this type of work.

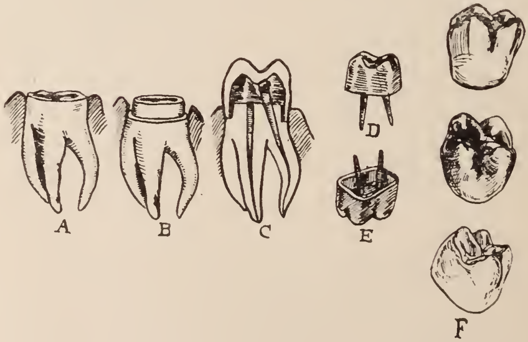


Fig. 17

This one feature, as I stated before, I wish to make the progressive, scientific line of demarcation between the old type of porcelain jacket crown and my conception of mechanical principles correctly applied, which have led me to delineate this as a *porcelain veneer crown,* for it truly justifies this appellation, as we controvert the old adage of all porcelain operators, that "In *bulk* there is strength."

This applies *only* to the porcelain veneer crown, as the old adage still holds good in most of the other types of work. In explanation of this, I will say that I came upon this principle in my experiments by studying Nature's inherent mechanical principles as manifested in the placement of the dentin underneath the enamel of the tooth. I have even gone a little further and exagerated the planes of the dentin under the enamel so as to increase and make more efficient these mechanical principles, because our cements do not give us the adhesion of porcelain to the dentin as the natural close cemented adaptation of the enamel rods in the dentin.

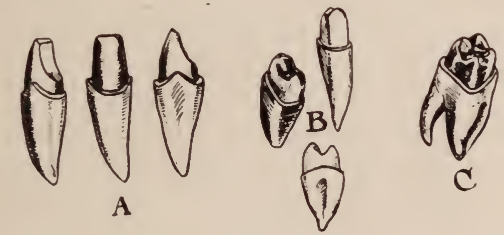


Fig. 18

If we will take a natural tooth, place it in a flame, and crack the enamel from the dentin, we will notice certain convolutions in the various teeth; and if we will notice these closely, it can plainly be seen that these surfaces or planes—so generally as to almost make it a rule—are at right angles to the applied attritional stresses in mastication, and that the enamel rods are generally at right angles to these surfaces. Now, by making these planes *positive* we are enabled to make our porcelain veneer as thin as the enamel and gain thereby again as much strength in our finished product as we will get by preparing the tooth in the old way—any old way, just so it is cone shape.

This preparation, it will plainly be seen, dispenses with the necessity for bulk in porcelain, by making the veneer cone take all the stress of mastication instead of forcing this duty upon the porcelain itself. It is also a fact that when stress is applied upon porcelain seated in this way upon the various flat surfaces it is inestimably stronger than where it must stand a torsional force without the support of this form of resistance preparation. Herein lies the main strength feature of the porcelain veneer crown. Of equal importance is the fact that this principle, correctly applied, makes it absolutely unnecessary to devitalize any of our pulps unless conditions necessitate devitalization under any circumstances.

Fig. 18 shows us a central, a bicuspid and a molar prepared as veneer cones should be prepared, taking advantage of all the planes in the dentinal surface, even accentuating them, and adding thereto the flat surface of the shoulder to take care of all strains that pass over the periphery circumferentially.

A RESUMÉ.

In my paper I try to state, in as few words as possible, the outline of a procedure that must be followed to establish a systematic scientific yet simplified technic for this type of endeavor.

I will now endeavor to explain why I ask you to follow me in the work I have tried so hard to specialize in; I also wish to eradicate some misconceptions I have run across in the minds of some of the men who are now attempting this work.

There are some who feel that they must devitalize to place a porcelain veneer crown. This, I feel is an injustice to this type of work, which really is the only work we have that will positively protect a live pulp in a tooth and give subsequent satisfaction. It is also an injustice to the patient, for we are realizing more and more that a pulpless tooth is a menace to the physical well-being of our patients. If my last assertion is true—and I feel that it is—then to devitalize is wrong, and I advise against it. Again, if this is true, then the only individual crown we are justified in putting in the mouths of our patients is the porcelain veneer crown.

Here again comes the question, Why not a gold veneer crown? This is a hard question for me to answer, but my experience shows that pulps are prone to die under them; not all, mind you, but many, especially in those cases where there has been no secondary deposit of dentin, where retrogressive changes have not taken place. I am in a quandary as to why, but these points come to my mind.

Does a pulp need a certain amount of light to be healthy? Does the gold prevent a certain, as it were, breathing of the tooth, not allowing moisture to pass through it, but making only for a reservoir of stale fluids in this cup that eventually sicken these delicate tissues? The porcelain veneer crown allows for both of these, I feel. It is a conclusion that some more astute mind than mine will have to determine.

Again, it is asserted that my method of mechanical retention is not necessary; that all one need have is a close adaptation and the strength will be adequate. This, I know, is wrong, for precedent has established it definitely.

The reason for the general failure of this work formerly was because they paid no attention to the mechanical details and relied upon close adaptation to retain their work.

I do not wish you to get the idea that I do not believe in close adaptation—I do—but no piece of porcelain can hug the tooth tighter than the foil on which it is built will permit. We all used to get the best results on a one-thousandth platinum foil. When this is stripped away, the porcelain will settle a bit closer to the tooth, but not much, for we need about this thickness to allow for a proper handling of our cementing materials.

If adaptation only is necessary, why cut a shoulder at right angles into the tooth? Why not a taper form of preparation that would finish flush at our periphery? I need only refer to the many sad experiences of those who have tried this, proving conclusively that we *must* rely upon some form of *mechanical retention.* There is also a diversity of opinion as to what instruments and materials are best to use in preparing our teeth and for taking the impressions. I feel that the more we simplify our procedure, and use only those tools and materials that will give the quickest and best results, the better.

A pure carborundum or a heatless stone will surely cut off the enamel quicker and better than any other. Care must be taken that no heat be generated sufficient to burn and kill the animal matter in the dentinal tubules. If this is done, I feel that it is only a question of time when the pulp will die, for live matter and dead matter will not exist compatibly in any structure of the body.

After our stones we use burs. These must be kept cool under a constant stream of cool air. As the air blows the gum margin free of our tooth and working instruments, the fewer instruments used under the gum the better, and there is none that will handle this step so quickly and nicely as the No. 58 S. S. White Revelation plain fissure bur.

There are some who would rather cut the shoulder just at the gum line with Friedman Bros. tapered cross-cut fissure bur No. 1-2-3, and then deepen and finish the cutting with their end cutting bur No. 0-1-2. This is a trifle slower, and perhaps at first easier, but when one becomes proficient it is possible to complete the shoulder in one circumference of the tooth with No. 58 S. S. White Revelation plain fissure bur. Because of the many palpable, quick and severe chemical reactions in the saliva of the mouth, which are sure to react upon any cement placed in the mouth, it is expedient that we protect our cement margin at the gingival as much as possible, and to do this I feel it absolutely necessary to carry our shoulder under the free margin of the gum as far as possible. This, with a correctly fitted joint of porcelain to the tooth, will give us a free gum margin that will hug the tooth tightly and so protect our cement line from the rapid, severe chemical changes in the saliva. The depth of the shoulder into the tooth need only be sufficient to give a flat seating to our porcelain.

Relative to the occlusal preparation of our posterior teeth, I find many men satisfied to make only a flat top or surface to the veneer cone.

There is no doubt but what many of these cases give satisfaction where we make the occlusal portion of our crowns heavy; but I again assert that a stronger, more resisting crown can be made by carving the occlusal so that all triturating strains of mastication are taken up by proper inclined planes on the occlusal rather than allowing these divers stresses to be taken up by the porcelain and transmitted peripherically to the shoulder under the gums. With the occlusal planes taking care of their proportionate share of these masticating stresses, we still have a peripheral strain passing over the side of the tooth, and the less there is of it the less pounding is there transmitted to our thin cement union, to break it up at our peripheral union of the shoulder. The facts are so self-evident to me that I cannot see the wisdom of neglecting even one feature of the correct mechanical preparation of our veneer cone.

Then, there are those teeth worn flat on the occlusal where the attritional strains are changed somewhat. Even these are better off by deepening the sulci to assist in diverting the lateral strain in the crushing of food, although they need not be made so prominent as in an unworn tooth.

Now, as to our impression materials. I use Detroit modeling compound because it will stand up best when dry heated. As to the S. S. White Co.'s Tenax Wax, I have found the superior qualities of this wax by far preferable to any other wax I have ever used.

There is just that nicety of resilience that is needed for this work, and it will take a sharper, truer imprint, when properly handled, than any I have ever tried.

I am sure that if you will use all these materials consistently and as I have outlined them, you will get just that satisfaction that all good workmen get when their materials give them the results they seek.

There is another bone of contention among porcelain workers that I wish to speak of, and that is the direct versus the indirect method. If I am consistent relative to the depth of the shoulder under the gum as a protection to our cement margin, then the direct method is impossible for it is beyond any of us to properly fit a matrix two-thirds of the distance under the free margin of the gum. Adherents of the direct method insist that we take too many chances of error in getting a perfect reproduction of our prepared tooth.

The technic of impression taking is not a difficult one if we will always bear in mind that our cup or impression material retain or extend beyond the margins or surfaces we wish to take an imprint of, far enough so that there is no escape of impression material until these surfaces are passed, and that this material be positively confined in this cup. Therefore, a seamless cup should be used, the material held under compression until thoroughly chilled and carefully removed.

If this be done, then followed with as careful a technic as is required of any of the filling materials, there is no reason why we cannot have just as perfect a reproduction as the prepared tooth itself.

I am sure a careful perusal of my technic will convince you that there is no better or easier way of getting a more perfect mechanical structure and finished product than that which I have outlined here.

SETTING AND FINISHING PORCELAIN VENEER CROWNS.

When setting a porcelain veneer crown, look at that portion that fits the shoulder in the tooth and by getting the glint of light on it, one can readily see the feather edge or excess. This should be ground away with a fine grit mounted stone, or if light with a coarse cuttle disk.

Try the crown on tooth to see that it goes to position.

Dry your tooth carefully, saturate with alcohol and dry with compressed air. Dehydrate tissues about the tooth.

Make up a nice creamy mix of Pinches Crown & Bridge cement of the same color as the gingival coloring of tooth.

Take a pointed instrument and fill the crown level full over the shoulder and without an air bubble in the cement.

Put it over the prepared tooth carefully and press gently to position and with only enough pressure to make the cement flow easily.

When crown is in position hold it there with same firm pressure but do not give it an extra hard push for this is often the cause of a break.

After the cement has set hard take a very fine pointed lancet or knife and break your cement off by getting the blade underneath the cement and cutting incisally or occlusally. This will prevent laceration of the gingival tissue and also prevent pain.

If there is an unevenness in the union of tooth and crown grind the joint labially and lingually with fine Arkansas stones and the mesial and distal with strips. The finishing polish can be done with pointed wood points, tape and fine silax.

At this time attend to your articulation or occlusion. If done before crown sets one is apt to fracture the crown as the patient bites upon it. When ground to fit, polish with garnet and coarse cuttle disks.

DENTAL SERVICE AT THE CHICAGO PLANT OF MONTGOMERY WARD & CO.

BY EARLE H. THOMAS, M. D., D. D. S., LL. B.

Every phase of health and its relation to a clear brain and efficient service is of vital importance to large, progressive industrial corporations in these modern days when "efficiency" is the watchword. Therefore we find, as medical departments of most of them, well equipped hospitals with physicians and nurses in constant attendance, resulting in, as Montgomery Ward & Co. say, "The improvement in health and happiness, and consequent efficiency of our people."

The phase of health that is of especial prominence at present is the relationship of septic and neglected teeth and mouths to general systemic diseases, and, in view of this, it is not surprising that special consideration be now given to good dentistry by many large corporations through their Welfare, Educational or Efficiency departments, with the resultant installation of Dental departments. Of course, this is a step toward greater efficiency, but humanitarian principles play no small part in its conception and execution.

Many corporations during the last few years have secured the services of dentists whose work was limited to the relief of toothache, the teaching of oral hygiene, and the examination of the teeth with advice to secure the services of an outside dentist—some corporations even going so far as to make this compulsory. Montgomery Ward & Co., however, were among the first of the larger corporations (they employ around 6,000 in their Chicago plant) to enter into this phase of welfare work on a large scale, with the broader policy of doing for their employes actual reparative dentistry in all of its branches except orthodontia. They had no precedent to follow and so worked out their plans as they went along, trying first one and then another, the peculiarities of dental service under such circumstances taxing the ingenuity of both Dental and Efficiency departmentments until now experience has materialized into a set routine of practical procedure.

It seems that the main objection voiced by most corporations against actual dental work for their employes, is the fear of continual malpractice litigation through the bad influence of quack lawyers who keep in constant touch with all opportunities for creating trouble around a plant of this kind. Montgomery Ward & Co., however, decided to risk all this trouble and expense in order to benefit their employes, and although the Dental department has been in existence for almost two years and has taken care of over 3,000 patients, not one suit of malpractice has come up and the employes are practically unanimous in their expressions of praise and good will toward the dental department and its beneficent services.

Another objection to the installation of this kind of service was the perplexing question of the charge for services rendered. To give all classes of dental service free would be too paternalistic and every welfare worker in a large corporation knows that tact in keeping this attitude from the minds of employes needing welfare service is very essential. Free dental service would also have a tendency to suggest to the mind of the average employe that the work done would not be of the best. On the other hand, to charge for the work would have a tendency to suggest to the employe's mind that the company was trying to make money on the venture.

Montgomery Ward & Co. overcame both of these difficulties and objections by offering free dental examinations, advice and relief of emergency cases and making a charge for only actual reparative work, emphasizing in every possible manner, however, that this charge was the actual cost of the service rendered—in fact, below cost, as no overhead, rent, heat or light expense is charged against the dental office, only the dentists' time and material used.

Nothing in connection with the office is compulsory yet. It has built itself up through merit and good service from one chair to five chairs, with the actual need and likelihood in the near future of another chair.

A great deal of the success in the starting of the office was due to the kindly co-operation and assistance given by the medical department in recommending numerous patients to the dental office to have the mouth condition taken care of, and as the medical department had built up a great confidence in the minds and hearts of the employes, its recommendations were invariably carried out, with the result of an early waiting list to see the dentist.

One factor working continually against an office of this kind is the natural tendency of an individual to crave for pity, consolation, etc. after a visit to the dentist, with the added psychological peculiarity of magnifying and exaggerating every incident in connection therewith. You can readily see how a few young girls scattered through a department of, say 500, might easily spread any unfortunate incident; hence, the great care and consideration necessary in the handling of every patient and the necessity of a good working knowledge of human nature in all its numerous and varied presentations.

I will now briefly describe the present working plan of the office, bearing in mind always that many schemes were given thorough trial before arriving at the present system of conducting the office. The dental office is a part of the Welfare department which is closely allied with the Efficiency department. It is altogether separated from the Medical department, although, of course, we work in perfect harmony and are often of great assistance to each other in the diagnosis and treatment of associated oral and general constitutional conditions.

The dental office is equipped with a Ritter white enamel equipment consisting of five chairs.

The office force consists of six dentists, four working full days and two working half days, and one dental nurse. The dentists are employed on a straight salary, it being thought inadvisable to place them on a percentage basis as that might lead to hasty and imperfect work.

The office is open from 8:00 o'clock a. m. to 5:00 p. m. One dentist spends practically all of his time examining teeth, relieving emergency cases and giving individual instruction along oral hygiene lines. The salary of the dental nurse, the overhead expense, heat, light and rent are charged to welfare. The salaries of the dentists plus the material used is the sole basis of reckoning charges against patients having actual reparative work done. Thus, you see that the work is given to the employe below actual cost.

The examination of teeth and oral conditions, relief of emergency cases, and all advice and instruction along oral hygiene lines is given free of charge. I might emphasize here that we spend a great deal of time trying to educate the employes regarding the detrimental practices of the dental quack, as a large percentage appear to patronize these charlatans of the dental profession. A lengthy article along these lines by the writer was recently circulated among the employes.

All work is done on the company's time, during working hours, and the employes are paid for their time while in the dental office. The average time of each visit of an employe to the dental office is three-quarters of an hour, although there are no restrictions—we may keep him as long as is necessary. Leaving all financial considerations aside, how much better able to work is an employe who has a good night's rest than the one who has to spend evening after evening in some dentist's office and waiting, possibly two hours for his turn each time, considering the way some offices are managed.

There is a private automatic telephone system in the building and all of our patients are called to the dental office on the telephone about fifteen minutes before they are wanted, thus giving ample time for arranging the handling of their work while away and also plenty of time to get to the Dental office. No definite appointments are made with any one unless it is one who is hard to reach by means of the telephone.

When an employe has a toothache his division manager calls up our office and notifies us. We usually have the time-keeper (there is one in each division) send the employe to our division at once unless we are very busy, in which case we aim to call him inside of fifteen minutes. At the time of treating the toothache, if it is necessary, the patient is given a sufficiently long educational talk on oral hygiene, the condition of his mouth and its relation to health. We are invariably then asked to place his name on the waiting list for a thorough examination of his teeth, and if he would like us to do the work, an estimate, based on cost, to be given. We are then usually able to persuade him to have his whole mouth put in good healthy condition. Our emergencies average 15 per day, and in this manner we reach a number who are not educated along dental lines and who would not think of going to an outside dentist except to get a tooth extracted, and sometimes not even then. In fact, if we are to be of any help to the efficiency of the employes, these are just the people we must reach, as the others will keep their mouths in good condition without our advice.

As we work for the employes only, and not for their families, this disproves the assertion sometimes made that we are taking work away from the outside dentist. The fact of the matter is that we greatly aid him by doing so much oral hygiene education, and by the employes we reach stimulating their families and friends to the far-reaching benefits of oral hygiene and to the criminal practices of the quack, and the effects of bad dental work on the health. In all our dealings with employes, we are ever preaching the evil of the quack dentist.

Another of our policies that disproves the assertion of our detrimental influence on the business of the outside dentist is this —when an employe, presenting himself at the office with a toothache, has his own dentist, or knows a good outside dentist, we invariably advise him to have his work done there rather than at our office. It is only logical that we do this, as we have over 200 on the waiting list practically all of the time, and it means almost a month's wait on the list before we can get started to do his work. Over 200 on the waiting list most of the time would indicate that our office has surely been a success, and I believe a great deal of this success is due to the time spent in educating these emergencies along oral hygiene lines.

Any employe wishing to have his teeth examined may call our office on the phone and have his name placed on our waiting list, and these names are called in the order of application, as fast as possible.

Even though the patient intends to have the work done by an outside dentist, careful examination, recommendations and advice are given, and all with the aim of co-operating with—not antagonizing the outside dentist. In fact, we are often of assistance to him in looking after conditions that possibly could not go safely the length of time between visits of the patient to his office.

Patients with very septic mouths who, after examination, say they are going to have the work done outside, are called back to the office a short time later to see if they are having their teeth attended to and if not they are given a little stimulation by means of a straight-from-the-shoulder talk.

Medical examination is compulsory, and all new employes are required to pass this, or they will not be employed. When the medical examiner finds distinct evidence of a septic mouth, he refers the employe to the dental office and his medical examination will not be O. K.'d until he is passed by the dentist. In all of our work we aim to co-operate with the Medical department, whenever it is possible in diagnosis and treatment, and the cause of many cases of continued temperature, rheumatism and neuralgia has been traced to the teeth.

Numerous bulletin boards are placed in various parts of the building, in the different divisions, and one of the features of dental education is the posting of bulletins on oral hygiene and the importance of the care of the teeth, etc. There is also a small newspaper published frequently, called "Store News," and oral hygiene articles are often inserted in this paper.

The work done in our office includes all kinds of fillings, extracting, bridgework, plate work, prophylactic work, in fact, every branch of dentistry, with the exception of Orthodontia.

We always give an estimate on fixing up the entire mouth; we refuse to do patchwork; we place no fillings in a mouth that is in a filthy condition, and we always aim to place the posterior teeth in efficient shape before fixing the anteriors.

We spend some time teaching every patient the correct use of the tooth brush, and the value of oral hygiene, and its relation to the general health.

We aim to do as much work as possible without devitalizing and treating, especially abutments for bridge work, but where we do devitalize we spend all the time necessary to treat and fill the roots thoroughly as we realize the dangers to the health of focal infections around the teeth caused by improper and hurried root canal work. It is realized by every dentist in the office that the cause of such diseases as rheumatism, heart disease, kidney disease, joint infections, eye troubles, neuritis, pyemia, septicemia, etc., have been traced to infections around the root apices of teeth containing poor root canal fillings. We, therefore, spend a great deal of time doing this work to the best of our ability.

Wherever it is possible to build up a tooth to normal shape and function with a filling we do so, leaving crown work as a last resort, as we realize the superiority of a filling over a crown, both as to shape and irritation to the gums.

We use silicate fillings in the anterior teeth as a rule, and never place a gold shell crown in the front of the mouth for esthetic reasons.

In all our anterior crowns we use cast gold bases because we see too many examples daily of the results of just cementing on ill-fitting porcelain crowns with a post alone.

In most of our amalgam fillings we place cement bases as a protection to the pulp.

In all our work we use the best materials and supplies—gold, cement, rubber, teeth, etc.

In cleaning and prophylactic work, we do not just run over the teeth with a brush in the engine, but we scale all the deposits off thoroughly around and under the gums, even if such process should require many hours.

We realize the importance of thorough sterilization and all ordinary instruments are boiled after each patient is treated. Burs, etc., are sterilized in lysol, and forceps, broaches, root canal instruments and materials, etc., are kept in a formaldehyde sterilizer.

The method of payment for work done was a very perplexing problem to master, as we did not want to handle money in the office. After trying several plans we now proceed as follows: The employe signs a slip in the dental office, giving the cashier permission to take the named amount out of his pay at the end of the week. These slips are sent to the cashier at the end of each day. The receipt for the amount is always placed in the pay envelope in place of the amount taken out.

The average employe can only conveniently pay about $1.50 per week, and we usually spread out the work so he can pay for it as he goes along. In cases, however, of extensive bridge work or plate work, where an employe can pay but $1.00 or $2.00 per week, it is evident that the completion of the work would be delayed too long—so in such cases, if the employe is worthy, the Welfare department pays the full amount of the bill at the start and then the employe gets the work finished at once, paying back the Welfare department as much each week as he can. This allows even the poorest, financially, to have good work done without payments being a burden.

There is a savings association in the house and if the employe belongs to this he may borrow the necessary amount from the association to pay his dental bill in full. I might mention here *re* employes in dire need of dental service whose financial condition is such as to prohibit the smallest payment, if the employe is found worthy by the Welfare department, the work will be done gratis. In all such cases the home conditions are investigated by visiting nurses of the Welfare department.

Employes who have been with the house one year and can pass the medical examination, automatically become members of the insurance association and are then entitled to all medical and hospital service free, this being paid for by the company. Any major oral surgery operations come under this head and are done gratis.

The company does not maintain an X-ray equipment at present, but contemplates installing one in the near future. Patients are referred to specialists in that work when necessary and they pay for such work themselves, except where it is considered one phase of the diagnosis of some general health trouble, when such work is paid for by the Insurance Association.

All of our dentists are very competent and conscientious workers, giving only the best and highest class of work. The writer specializes along oral surgery lines and gives the office the benefit of this experience in all cases of difficult extraction and minor oral surgery.

Our record chart embodies some original ideas which may be of service to others. The one card keeps a record on its face of the name of the patient, time card number, division the employe works in and telephone number, spaces for a record of every operation that has been done on each tooth before presentation of the patient to our office, record of all work found necessary, after a thorough examination, space for a record of all this necessary work that is done subsequently by some outside dentist, and space for an accurate record of any work done by us subsequent to the examination with also the dates, time consumed, initial of operator, etc. On the back of the card is a record of the date of each call to the dentist's office, the time of the call, the time the patient arrived at office, the time patient leaves the office, the amount of each charge and the date the patient is to be called again. The time to subsequently call the patient is not kept in an appointment book, but by means of a tickler system. The top of the face of the card shows numbers from 1 to 31 and the card is flagged with a colored clip on the date the patient is to be recalled. Each dentist has a different colored clip and, therefore, only one working file is used, which greatly simplifies matters.

In the very near future we aim to have it made compulsory for every employe to have all of his teeth put in good healthy condition, and for every new employe to have a compulsory dental examination with suggestions as to what is necessary to be done.

It might be interesting, in conclusion, to enumerate the many other benefits that the humanitarian principles of this large mail order house have induced them to furnish to their employes, but I fear such would unduly lengthen the paper. I might mention, however, that they also maintain a dental office in their Kansas City plant.

PREVENTION OF PYORRHEA ALVEOLARIS.*

BY DR. J. L. HOOVER, SHELBYVILLE, ILL.

At the present time there is considerable agitation regarding pyorrhea alveolaris and the cures therefor. Without such agitation, not much good can be accomplished. If continued, prevention will result, and possibly the cure for many cases.

I am firmly of the opinion that pyorrhea is not a constitutional disease. My reasoning dictates that it is purely a local one; that the dentist is partially responsible for many cases I am sure. I attribute incipient pyorrhea to several causes, of which I shall name the chief ones and attempt to discuss them from their various angles:

First—Loss of contact point.

Second—Indiscriminate extraction of the third molar.

Third—Faulty root treatment.

Fourth—Irregularities of the teeth, including faulty articulation and occlusion.

Fifth—Salivation.

Sixth—Neglect to remove tartar formations.

Of these points named, the first one is the main cause. When the contact point is lost, food is crowded down between the teeth during mastication; meat and vegetable fibre that would ordinarily be crushed if the contact point was normal, are crowded down against the gum, so that the gum is bruised. Possibly at first unnoticeably so; later the gum becomes much inflamed and sore, and sometimes a pocket is formed and septal abscess results accompanied by severe pain, which the patient usually describes as neuralgia. The first symptom is apt to be where the stress of mastication is greatest, the teeth become sore and move somewhat in their sockets under pressure; the patient cannot masticate properly; the teeth seem elongated, which they are, and the rocking backward and forward of the tooth begins, which eventually results in its ruin. Incipient pyorrhea has begun.

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*Read before the Central Illinois Dental Society, February 20, 1917.

If, at this stage, the patient receives the proper attention and the teeth are corrected, the danger of pyorrhea is averted.

I believe it possible to induce pyorrhea in a perfectly normal tooth by simply pushing backward and forward, or laterally, as the case may be, indefinitely. That the same condition will eventually present itself, so that you could in no way differentiate between it and a perfectly normal case of pyorrhea brought about in the usual manner.

When one tooth only becomes infected, it is an easy matter for the same condition to soon present itself in teeth in that immediate vicinity, it being impossible for the bone to become firm around the tooth as long as the condition exists, because it does not have time, as the continual movement prevents.

The above statements could be supplemented and prolonged indefinitely. You may draw your own conclusions to coincide or adversely, as the case may be.

Loss of the third molar is responsible for the loss of the contact point in many cases. I protest against its extraction unless a positive detriment with possibly serious results, then, and then only, would I consider it.

Have you ever heard the advice given such as "The third molar is not much good; I would just have it pulled out." Have you ever given such advice? Do you do so now? Probably not, but there are dentists that do, and plenty of them that have in the past. Many patients will often inquire, "Is that a wisdom tooth? If so I do not believe I will have that fixed, they are not much good anyway, and if it gives trouble I will just have it pulled out."

Now, those people have been receiving the wrong kind of education from somebody, and it is up to the dentist to remedy it. The third molar is of the same material as the others, and it is just as important, or more so. They probably need more attention, which they do not get, due to the difficulty of access with the brush, etc., and the difficulty in some cases of inserting fillings. If they were filled just as well, and the patient gave them a little extra consideration, they would last just as long. They certainly are entitled to a great deal more care and consideration than they are receiving at the present time.

It is a well known fact, that the first, second and third molars move forward during eruption. In case the baby molar is extracted prior to eruption of the first molar, the first molar will move forward far enough to take up a great part of this space that the second bicuspid should occupy when finally erupted, so that the result is usually an irregularity. Great care should be used to see that the child retains the baby molar until the first molar is in position. It is many times allowed to decay entirely away, and is sometimes wrongly extracted.

The second molar has also the same faculty of moving forward during eruption as the first molar, which also applies to the third molar in a greater degree. If the second molar is extracted prior to the *first* formation of the third molar when it finally appears, it will be found in almost the same position that the second molar formerly occupied.

Now, the point I wish to make is this: *That the moving forward of the third molar during eruption and afterward, is nature's method of preserving the contact point,* as in some cases the contact point is worn off by abrasion against the next tooth, still you find the teeth close together, no evidence of gum disease and fine contact, and all due to the retention of the third molars.

That the third molar does this, and keeps up its function almost through life if properly cared for, is the greatest of all reasons why it should not under any circumstances be extracted where it is possible to save it. In many cases where the third molar has been extracted the patient will come for treatment and filling. If you find the contact point defective the teeth are filled and the condition corrected, the patient departs, comes again in nine months or a year, with the same old neuralgic pain, the same sore gums, the contact point lost, the teeth are beginning to separate. In many cases as a permanent corrective measure which I have found very efficient, is the crowning of the first and second molar and prior to setting them, soldering together at the top.

Now, a few words about the gold crown. A physician in one of our neighboring towns has read a paper practically damning the gold crown, the exact words I am not at present able to reproduce. But from what I get from the garbled reports, are to the effect that if the patient has at least three gold crowns in his mouth, that he has practically procured his passports and is in fine shape to sail for the Better Land. That to them are attributable diseases of rheumatism, valvular heart trouble, Bright's disease, etc. Of course there are many ill-fitting crowns that should be removed, also other appliances. So much admitted.

On the other hand, if I should meet a man that wore a pair of glasses for about ten years that did not fit in the first place, at the present time he could hardly see a thing, I should be about as well justified in attributing all the diseases that I did not thoroughly understand to those glasses; or, attribute all cases of pyorrhea to the administration of calomel. All such statements should be discredited. The fact about the matter is, that those diseases existed long before the gold crown was ever invented.

With the X-ray we have been able to discover conditions that heretofore we did not know existed, but they can usually be corrected. Large amalgam restorations are fine in some cases; also large inlays. But, for a good lasting, permanent piece of dentistry a good fitting gold crown can not be excelled. If absolutely necessary to crown the third molar to save it, I do so. If it becomes clearly apparent that a so crowned third molar is a detriment, you can extract it; but, if you extract the tooth and the patient develops pyorrhea you are up against it.

In regard to *Salivation,* many cases of so-called pyorrhea are purely attributable to this cause through mercurial poisoning. The practice of giving calomel to regulate the bowels should be discouraged wherever possible. If the history of many cases could be traced, you would no doubt find that it was attributable partly to calomel, oftimes self-administered. Many persons' teeth are ruined by this method. If badly salivated, extraction in some cases is the only real remedy. In only light cases, there is absorption of the bone, and the tissues surrounding the tooth rarely recover their original tone. If pyorrhea does not result, the results of the calomel are observable during the life of the patient. The relation between pyorrhea and salivation is well worth investigation. You could no doubt cite many cases that have resulted much to the detriment of the patient. There are many other things that will answer the purpose. Why the calomel?

Neglect to remove tartar formations is also the cause of some cases. The contact point is lost through loosening of the teeth or loss of one or more teeth, and the disease develops along the old line.

Regarding faulty treatment. That many canals are not filled properly is true. That many are not opened up properly before the filling is attempted ofttimes causes abscess, absorption of the bone, and finally loss of the tooth. We would recommend that in case a tooth was lost, that it be immediately replaced by a bridge to prevent loss of the contact point between the others, and possibly prevent pyorrhea.

I am of the opinion that we are prone to devitalize too many pulps. If you will kindly look over your books you will be surprised to note the few charges you have made for pulp capping.

I believe that we should save all the pulps possible, and that the method should be again resorted to wherever promising. Because the pulp is exposed it is no good reason why we should not attempt to save it. I think that devitalization should be a method of last resort.

Before our State Society meetings I have heard the following statement go unchallenged:

"I never crown a tooth without first killing the pulp." I believe that the teaching is wrong. If it is good policy to put a capping over the pulp and put in a large filling, why is it not good practice to save the pulp if you are going to crown it?

I have so crowned many teeth, and have had no reason to change my mind. The only excuse for killing the pulp is that it is easy.

To properly cap the pulp, first, an escharotic should be used, of which creosote is a good one, then, dry the cavity, and flow soft cement lightly over and let harden; later a thicker coat of cement. That the acid in the cement will eventually kill the pulp I do not believe possible under those conditions.

In summing up, I wish to impress the following points for your kind consideration:

That pyorrhea is purely a local disease, and not systemic.

That the cause is where you find the disease.

That pyorrhea can not be cured unless the cause is removed and the condition corrected.

That it is pretty hard to maintain the contact point unless the third molar is present.

That the disease is not transmissible.

That the cure is almost entirely mechanical.

That it is the duty of the dentist to do all in his power for existing cases, and to prevent others.

That you can overcome some of the bad effects or results of pyorrhea by administration of medicine internally. But that it is almost as useless to administer medicine internally or hypodermically for the *cure* of pyorrhea as to use the same mode of treatment for cinder in the eye.

That for all the so-called cures that the dentists of the United States are induced to buy annually at an expense of thousands of dollars, we have no commensurate returns. If there is basis of fact for the statement herein contained, the paper is justified.

SOME THOUGHTS ON DENTURE CONSTRUCTION.*

BY ELBERT BRITTEN OWEN, D. D. S., ST. LOUIS, MO.

I was glad to have been invited to this meeting for two reasons: First because I wanted to become acquainted with the men of this city and district, as I have been told you have a splendid organization and a live, enthusiastic membership. Second, because I know you are interested in better prosthesis.

We are living in a humanitarian age when it is the duty of each man to add something for the health, comfort and happiness, not only of himself, but of his fellow man. That is why you men are here today; that is why you are working, worrying, striving every day, that you may render to your patients a better professional service which is in harmony with the deep conscientiousness which we all feel towards our work.

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*Read before the Madison County (Ill.) District Dental Society, Alton, November 1, 1916.

That the technical procedures of the average dentist in such operations as root canal filling, individual restorations, etc., have made rapid strides of advancement in the past few years there can be no doubt. This has been due in a great measure to the wonderful work of the X-ray and our definite knowledge of serious systemic conditions being produced or very much aggravated by poisons resulting from mixture with saliva of bacteria from loose discharging teeth, and irritating and insanitary crowns and bridges.

Better diagnosis and more definite prognosis on the part of the dentist is leading to the extraction of a great many teeth now that were previously considered favorable for treating. This is creating greater demands upon the prosthetist and we must rise above the artisan and mechanic and construct dentures that will elevate our branch of dental science to that high plane of efficiency which is in keeping with the increased demands that are upon us.

It has been hinted that denture construction, in the hands of the average dentist, is a neglected art. If such is true it is due not so much to the inability of the dentist as to his enthusiasm for operative work; lack of time, and perhaps the idea that he could not command a compensation which would justify enthusiasm for plate work. But illusions of this kind may and will be dispelled if one will only implant in his mind the following ideas:

1. The knowledge that he *can* render efficient denture service.
2. The *self-satisfaction* of rendering such service.
3. The fact that successful denture service is the most appreciated of all the efforts of the dentist.

We must not permit it to be truthfully said that prosthodontia is a neglected art; we must not be found wanting when weighed in the balance; we must not place in the mouths of our patients dentures that are so in name only.

But I didn't come up here to talk generalities. I came to talk about some of the phases of constructing dentures and I must now be about my task.

WHAT MAY PATIENTS JUSTLY EXPECT OF DENTURES?

I have been to a number of these meetings in different sections of the country, and almost invariably some one asks me how I know when I have made a good set of teeth; in other words, what constitutes a good set of dentures? I don't remember that I ever heard any one else answer that question, but I have my own ideas about how it may be answered and I am willing to give them to you. The best way to get at it is to classify the demands patients make of us when they present for dentures. One day you have an elocutionist or singer come in and tell you that she must have a plate that will not drop or annoy her while she is executing her art. Now if we consider that she has a legitimate right to expect this, and I say she has, then that must be one requisite of our dentures.

Then perhaps the next day your senator or representative comes in and tells you he must have a plate that will not drop right when he is presenting the strongest point of his speech and he isn't thinking about holding his teeth in place with his tongue. We must take care of him or our profession must bear the stigma of inefficiency to that extent.

Your next patient will tell you lines are forming in her face, and the corners of her mouth are drooping from the loss of her teeth; that her expression has changed and she doesn't look like the same person, of which fact she is always conscious. She has come to you for relief, which means that you must restore natural expression through teeth of the proper form, size and color, using mature judgment in their arrangement, and by supporting the tissues of the lips and cheeks in a way that will restore the contour of the face.

But by far the most important requisite of a set of dentures has not yet been mentioned. When a person arrives at the age at which most people have arrived when the wearing of artificial dentures becomes necessary, their health, vitality and physical stamina depend more than ever upon proper digestion and assimilation of their food. They being naturally upon life's downward slope and resistance lowered by approaching age, they cannot endure the systemic derangements induced by bolting food and poor digestion like a younger person. Hence, the performance of natural masticatory functions, and the stability of the dentures during such efforts, shall be the paramount object of our labors.

While I may not have time to go into details of all the steps of this work, I do want to dwell in detail upon the more important steps, one of which we must admit is the impression, upon which depend so many of the above mentioned characteristics of good dentures.

REGARDING IMPRESSION MATERIALS.

Considering the difference in opinion of some of our best men regarding the materials best adapted to impression taking, I shall consider it appropriate at this time to say something of my experience with these materials. As you well know, only two materials receive serious consideration at this time for taking impressions, viz., modeling compound and plaster of Paris. The one, in my estimation, which assumes less importance, modeling compound, I shall consider first.

As I stated in my talk, "The Impression Must Be Right," before the St. Louis Dental Society last month, the profession, with reference to the use of modeling compound, is divided into about three classes:

1. Those who seem to have lost all reason, are ultra-enthusiastic and use it for everything, full cases, partials and all.
2. Those who usually recognize its indications, use it where it is indicated and where it is not indicated they use plaster.
3. Those who have no use for the material at all and don't use it for impression taking in denture construction.

You can easily classify yourself.

MODELING COMPOUND.

It is the opinion of the writer that modeling compound is a very dangerous material to be placed before the profession as a scientific material for general use in taking impressions, and I fail to see why men over the country have apparently been swept from their feet in their enthusiasm over it unless it was due to the apparently wonderful results obtained, which were, I must say, alluring. These results are sometimes true, but often false, hence the material is deceiving; deceiving because the strong adhesion which you admire so much may be obtained by the formation of a temporary vacuum under the impression or by having the material pushed up under the cheeks and valved in the soft tissues, which would have to be trimmed off before a plate could be worn, thereby destroying the strong adhesion, often destroying all of it.

I have made a number of what I consider, from my own ideas of what constitutes a good set of dentures, successful cases that I was proud of and exhibited at meetings, from closed mouth modeling compound impressions, following along the lines of Dr. Greene, whose methods were modified by Mr. Supplee of New York. I have taken hours to get a set of impressions that were to my mind satisfactory, and which was a wearisome task both to myself and to the patient; finally it dawned upon me to look at this material as compared to plaster of Paris from a standpoint of their physical properties.

We know that the true principle of retention in artificial dentures is adhesion by contact, or in other words, capillary attraction; the same principle that holds two pieces of wet glass together when we try to pull them apart at right angles; we know that nature abhors a vacuum, and that a vacuum under a plate will be filled in with the yielding tissue sooner or later; and that suction, or atmospheric pressure, is not a true and permanent factor in denture retention; hence what we want is absolute adaptation of our impression or plate over all the surface to be covered with the plate. Now, if the mouth were a flat surface and the modeling compound could be pressed against it supported with another flat surface, it is evident that a sharp imprint could be had and absolute contact easily obtained, but the mouth is not a flat surface, it assumes various curves and irregularities, and the cup supporting the compound assumes similar curves and irregularities, making it necessary to press and work the compound to the areas we wish to cover and hold it there until it has hardened; at the same time, supported by curved surfaces, it is likely to flow upon itself, dropping from the palate and away from the periphery.

Whereupon, with plaster, properly confined and properly manipulated, it flows freely over all parts giving us that adaptation so essential. I therefore come to this conclusion: with much less time and energy a better and more reliable impression may be had with plaster, properly manipulated, than with modeling compound however well it is manipulated, the opinion of others to the contrary, notwithstanding.

It is the opinion of the writer that plaster is the best material in any one's hands, but it is certainly the best in his hands who possesses only moderate skill, for an impression taken with moderate skill, care and the proper technic, will be correct and there need be no anxiety as to whether the plate will be adapted to the mouth.

PLASTER OF PARIS

In passing I shall say something of the impression cup or tray, as its selection is more important than one ordinarily thinks.

It is better to make the cup for each individual case, but if this is not done and you wish to use a stock tray, take the following precautions: a tray should be selected which will not permit the tissues to be distended much more, if any, than the finished plate is expected to do, thereby giving you an impression of the tissues in as nearly their normal position as possible. If this feature be neglected, and a tray much too large is used, all the features are distended far beyond normal, the little attachments along the labial and buccal periphery are stretched out of position, and the plaster having no power of compressing these tissues, you get an impression out of their normal position, consequently a plate that does not fit around the periphery, to which is due the fact that a great many operators resort to scraping the cast in this region in order to secure a closer adaptation.

The tray should be trimmed low enough around the edges that it will not interfere with the normal position of the buccinator muscle on each side, and low enough posterior to the tuberosities in uppers not to interfere with the Pterygo-maxillary cords of the buccinator muscle. In most cases the writer constructs his own tray for each case in a way which will be described later on.

The features of an impression about which we should be cautious are: Height of periphery; relief of various muscles and attachments; and compression of the non-vibrating soft palate. With a tray made for the case or wisely selected from stock, the first two of the above will take care of themselves; but compression of the posterior palatal tissues must be brought about, for upon this feature, together with the proper length of the plate posteriorly, depend in a great measure the comfort and stability of the plate. They prevent gagging and nausea; prevent the plate from dropping while talking or singing, and they give biting power on the anterior teeth.

The compression just spoken of may be obtained by the bees wax reinforcement method as advocated by Dr. George H. Wilson, of Cleveland, which is as follows: A roll of softened bees wax the size of the little finger is adapted along the posterior border of the tray and about three-fourths of an inch forward on the buccal flanges, the wax softened and tray and wax pressed to position in the mouth. Have the wax rather soft as too much compression is not to be desired. Where the posterior cord back of the tuberosities has been indicated groove out somewhat to allow freedom of motion for these attachments. In re-inserting the tray with the plaster press the posterior part up first, bringing the wax in contact with the tissues, otherwise you lose the effect of the compression. This wax will also serve to prevent excess plaster from escaping posteriorly, forcing it out in front. When the impression has been removed from the mouth, the bees wax should have displaced most of the plaster in this region, being itself clearly visible. In making the mix of plaster, about an ounce of water at room temperature is used, to which has been added three to five grains of sodium chloride. Make the mix thin, for if mixed stiff the resistance to the tissues is too great, and our methods of manipulating plaster are such that we do not want resistance.

The writer feels very kindly towards a system of impression taking as advocated by Dr. Rupert E. Hall, of Philadelphia, of which I have made extensive use, more especially for lower full dentures, rather than for uppers. The entire technic is simple but efficient, and much depends upon delicacy of manipulation and upon the uniformity of mixing plaster. Speaking first of the upper impression, a stock tray is selected which is approximately suited to the mouth, filled with modeling compound; S. S. White impression tray compound is to be preferred here, but ordinary compound will serve the purpose. An impression of the mouth is obtained with this material, covering an area perhaps a little more extensive than will be covered by the plate. See that the compound does not drop away from the soft palate. Remove the impression, trim off excess, both in extent and thickness, but do not trim too low; leave it a little higher than your judgment tells you the plate can be worn. This is your tray, or impression cup, and may be roughened or scraped out some; however, this is not necessary. Make the mix of plaster by taking a large excess of water, accelerated, sift the plaster in, allowing it to fall through the water to the bottom of the vessel, bringing about a condition of voluntary saturation. Now when you think you have sifted in sufficient plaster for your impression, decant the excess water, and two or three stirs with the spatula gives you a uniformly even and thin mix which is desirable especially for this method of impression. Fill the impression cup already made, full, then allow some of the excess to run out as it is not necessary to put all this excess of plaster in the mouth. The tray is inserted and with light pressure and a slight rotary movement, is carried to position. Avoid pressing home with heavy pressure. The plaster having set the tray is removed. You will note the plaster is thin and flaky in places, and along the peripheral border, the tissues have cut through the plaster exposing the modeling compound border in places. Trim these places down somewhat that they may not offer resistance to the tissues, which are muscle attachments; also trim off any excess of plaster posteriorly and along the border. Now place the impression in a bowl of water preparatory to the second step. Another mix of plaster is made just as the first: Take the impression from the bowl of water, sling out the excess of water, pour in plaster and proceed as before, pouring the freshly mixed plaster right in on the plaster of the previous impression. You will find, after this second attempt, as a general rule, that your modeling compound is not exposed around the periphery, and instead of being flaky in the palate you have an evenly laid body over the entire surface. This would constitute the completed impression. It may be necessary, however, at times to make a third, or even fourth attempt. The impressions you will find are extremely difficult to remove from the mouth, and unless you are cautious you might lacerate the tissues in the task. The best way to remove the impressions is to have the patient close the lips together tightly and blow with considerable force. This permits ingress of air posteriorly, allowing the impression to drop.

The same general plan is followed for the lower. I would add as a precaution that the crest of the compound tray for lower impressions be scraped out to avoid the possibility of getting too much pressure on this delicate area, as you well know that the tender crest of the lower ridge will not endure much pressure. Permit the impression to spread out as far as practicable in the posterior buccal region, giving the plate thickened margins in this region, forming a groove between the margins of the plate and the attachment of the teeth, as advocated by the late Dr. Loomis P. Haskell, also Dr. Hall. The cheeks fall into this groove and add very materially to the retention of the plate.

CASTS

The materials for casts must be chosen with reference to the purpose for which they are to be used. I classify them as follows:

1. Plaster of Paris.
2. Investment compound.
3. Spence plaster, Weinstein's artificial stone, etc.

For some work plaster of Paris is suitable; for some work class two materials are required, but for the original cast over which to vulcanize artificial dentures the writer has, through experience more or less extensive with most materials on the market, come to the conclusion that, all things considered, nothing quite equals Spence plaster compound. Weinstein's artificial stone is a very admirable material but I find that it has no advantage over Spence plaster, properly mixed, but has the one disadvantage of requiring a much longer time to set.

Spence plaster was placed upon the market by Dr. Stewart J. Spence of Chattanooga, Tenn. It is a compound of Portland cement, plaster and certain chemicals to control the setting and expansion qualities.

In mixing this material, the ratio of water and compound is about one to three and one-half, and the mixing is much more laborious than mixing plaster. For an ordinary cast about an ounce of water is sufficient. This will require about three and one-half ounces of compound. The two are placed in a plaster bowl and mixed. At first the mixture will be very stiff, but the stirring should be kept up for two or three minutes, after which it becomes quite plastic. It is now introduced into the impression, which has been previously glazed with any good separating medium and soaked in water. The compound must be jolted into the impression for two or three minutes in order to give a smooth cast, otherwise it will come out very porous. A good way to confine the material in the impression while jolting it, is that suggested by Dr. Wilson: Take pink wax in strips about one and one-half inches in width and build a barrier around the impression, searing the lower border of wax to the impression all the way around. The cast will harden in fifteen minutes, but I wouldn't advise working it for an hour or two.

BASE-PLATE

This brings up the question as to whether we are going to use one of the wax compound base-plates or the vulcanized base-plate. It goes without argument that we must have one that will stand the strain of subsequent steps without bending or warping, as a yielding baseplate is our worst enemy. There are several base plates on the market that serve very well, but my method in a large majority of cases is to follow the double vulcanization route.

DOUBLE VULCANIZATION

By this is meant the vulcanization of the base or sub-structure, this to be used in the subsequent steps of bite taking, trial plates, etc., and the superstructure or teeth added by means of a second vulcanization.

Its advantages may be summed up as follows:

1. Provides rigid and well fitting bases for subsequent steps of bite taking, etc.
2. Provides a means of detecting any possible error in impression or retention before finishing the case.
3. Greatly facilitates developing esthetic features of denture.
4. Renders simple and efficient the process of automatic grinding of the vulcanized dentures.

Those who object to this procedure do so on the grounds that vulcanite shrinks on second vulcanization. But by the use of high grade rubbers and a hard non-changing cast to vulcanize over this shrinkage is reduced to a minimum, and such shrinkage as there may be is of such a slight degree that it cannot stand as a barrier to this procedure in view of its many advantages.

One thickness of a sheet of base plate wax is placed over the Spence compound cast, trimmed to the plate outline, the edges seared to the cast, flasked, packed and vulcanized. Before closing the flask after the case has been packed, the cast should be finished with tin foil to prevent any rough surface on the base plate that otherwise might result.

After vulcanizing, and the flask is stone cold, remove the base plate, trim excess rubber from edges, using Hall's abrasive wheels. The outer surface is not polished at this time, but scraped or sandpapered to provide a renewed surface for the attachment of the superstructure. The inner or maxillary surface is not to be changed only to remove any excrescences produced by defects on the face of the cast.

Wax bite planes are now built upon the base plates preparatory to the next step of registering the relation of the jaws or taking the bite. Working casts of plaster are poured into these baseplates which may be easily pried off when the plaster is set. The working casts will serve to attach case to articulator, etc.

REGISTERING RELATION OF JAWS

Upon this I shall not dwell only to emphasize one important point. In the baseplate-wax rim method of taking the bite, the mistake is often made of getting the upper and lower wax rims only approximately adapted to each other and not perfectly so, thereby failing to get the pressure on both sides equalized. This is the cause of much annoyance since it is the source of discomfort to the wearer, and we often resort to trimming the flanges of the plate to correct this when the trouble is really in too heavy contact on one side.

When the upper bite rim has been adjusted to the length of the teeth, fullness, etc., adjust the lower to it, approximately at first, but leave it a little longer than you expect the teeth to be, in other words, leave the bite a little wide. Now remove the lower, take a very hot wax spatula and pass it around from heel to heel (not crosswise), softening the wax to a depth of two or three millimeters all around. Replace this now and instruct the patient to bring them together and apply light pressure on them. When the jaws have approximated each other near enough to allow the lips to meet without stretching, fasten the rims together and remove. This equalizes the pressure over the entire surface.

The case having been mounted on the articulator with the working casts, proper articulation obtained and proven by trying in the mouth, the working casts are left in their position on the articulator and new casts of Spence compound are made in the base plates for the purpose of vulcanizing over the second time. No tin foil protection is necessary this time; the base plate will become pliable during second vulcanization but not plastic as in the first case.

After second vulcanization and plates are trimmed free from excess rubber, they are taken back to the working casts which are still mounted on the articulator. You will find, if you have been careful in previous steps, that the plates will now fit these casts just as they did before the teeth were attached, and you have your case, finished, correctly mounted on the articulator.

Any appreciable obstruction to a smooth articulation is now ground down with a stone; then emery powder, made into a paste with glycerin, is placed between the teeth, after which they are subjected to up and down and lateral movements of the articulator, first on one side then the other, until the articulation is smooth and velvety. The lower jaw of the articulator is then protruded to adjust the incisal relationship of the teeth, when they are ready for the mouth.

I invite you to inspect the specimens and models I have here, and ask any question you may desire.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

The Thirty-Fifth Annual Meeting was held at the La Salle Hotel, January 26, 1917, with the President, Dr. George C. Poundstone, in the Chair.

Dr. Joseph Colt Bloodgood, of Baltimore, read a paper entitled "The Preexisting Lesions in the Oral Cavity and Their Relation to Malignant Diseases."

DISCUSSION.

Dr. L. L. McArthur:

The object I think has been accomplished for which Dr. Bloodgood has come here. He has undoubtedly riveted the attention of the dental profession tonight on the possibilities that may arise from the simple and minute lesions of the mouth which dentists far more frequently than the physician or surgeon have an opportunity to see early. Any discussion of mine on this subject, I think, would be a waste of your time other than, perhaps, to emphasize two points which appeal to me as worthy. One, for example, is called up by the statement that a positive Wassermann was found in cancer of the mouth. I desire to extend to the dental profession in this connection the thanks of the surgical profession for emphasizing the fact that a positive Wassermann in cancer of the mouth is not an infrequent finding. A positive Wassermann does not necessarily mean a syphiloma in every case, nor contraindicate surgery. I do think that you may take it, not as Dr. Bloodgood meant it when he urged that a specimen be not taken in a case in which the diagnosis is not clear or in which it is reasonably doubtful. I am sure it was his desire to state that that specimen should not be taken except with the cautery knife. It is highly important, before any operative interference is undertaken for these suspicious lesions, that we shall know whether an ulcer is a syphilitic ulcer, whether it is a tuberculous ulcer, or whether it is a carcinoma, and that only can be determined by the microscope as positive evidence. Belief is one thing, but positive evidence comes from seeing the architecture of the growth. Again, thanks to the dental profession on part of the surgeons because the dental profession are now sending to us lesions at such an early stage that we are able to remove them successfully, and by successfully I mean a period in which there is no recurrence after three to seven years, and many of my dental friends present will recall cases in which absolute cures of this type for a period of many years have been obtained because the lesions were small. With this small lesion, it is unnecessary to make extremely mutilating operations which the regular textbooks on surgery still advocate, and which are daily in certain clinics being done, such as total removal of half of the jaw for a small carcinoma of the alveolar process, not using the cautery, but the electric saw to saw out a portion of the bone and leaving eburnated bone. I have successful cases living for a period of three years after the removal of carcinoma at one sitting that involved the alveolar process from which the molars had been removed because ulcerated and in the ulcer carcinoma had developed. Three months later carcinomatous glands which were left there as a protection after the Butlin recommendation rather than taking them out at the same sitting were removed. Such cases have been cured with no deformity other than incision in the cheek, with the jaw intact, and the patient in no way mutilated. A limited operation then is the operation which is going to come when, through such emphasis as Dr. Bloodgood has laid down the preexisting oral lesions can be attacked and removed either by the cautery or the knife.

Dr. Bloodgood has become very enthusiastic over the sealing of the lymph channels by the cautery as it burns out the area in the slow progress through the soft tissues over the knife. I do not feel that this is so absolutely essential. However, it may prove an advance.

I want to record as a causative factor of leukoplakia "tea tasting" in men who said they were not smokers. I recall three instances of cancer in men who told me that they were tea tasters in South Water Street. These tea tasters sit around a table that swings very much like a piano stool, and with a dozen cups of hot water take a sip of this brand of tea and that brand of tea into the mouth then they spit it out. In this way they develop leukoplakia, so that tobacco is not the sole causal factor in the development of leukoplakia.

We owe our thanks to Dr. Bloodgood for emphasizing early attention to the hygiene of the mouth. It do not think the last word has been said in regard to tobacco, the Betel nut, the stempipe as causative factors of cancer, and there are those who believe that abscessed, decayed, sharp, angular teeth are not an etiological factor of cancer at all.

DR. ARTHUR DEAN BEVAN:

Dr. Bloodgood has given us a very instructive paper, and I am sure it has been of great service to you who have so large an experience in this line of work. I would like to emphasize a few points from my experience with this subject. First, in reference to the question of syphilis as an etiologic factor in carcinoma of the mouth. Dr. Bloodgood evidently inadvertently omitted this in his discussion. I think there can be no doubt, and my attention has been especially called to this in the last year or two, that syphilis certainly, next to tobacco, if not more frequently than tobacco, is the most important etiologic factor in carcinoma of the mouth. I want to emphasize that point because many of these cases come to us with a question as to diagnosis. Many of them come to us with a history of syphilis, and are treated as syphilitic ulcers for a long time before a definite diagnosis of epithelioma is made. It is a fact, to which Dr. McArthur has called attention, that a positive Wassermann is very common in carcinoma of the mouth, and a positive Wassermann is usually correct. It may be mistaken, but it is usually correct, and it simply shows that a patient has developed carcinoma in the mouth secondary to an old syphilitic lesion. I want to impress that fact very forcibly upon you because I think it is so important in the diagnosis. Time and again, we have had cases brought to us who have been given iodid of potassium, salvarsan and mercury, and of course the moral is that these cases should not be allowed to go on with a doubtful diagnosis.

I think the point that Dr. Bloodgood has made in regard to the danger of removing a small section of tissue for diagnosis is one that should be somewhat conditioned. He and I have fought over that for a long time. I think the most important thing we do in these questionable lesions about the mouth is to make the diagnosis early, and I am in the habit of making this diagnosis with a little novocain, removing a small section of tissue, and then, I must say the point he makes is a good one, namely, that immediate action should follow. A carcinoma does not grow by leaps and bounds but as a continuous process. It grows exactly like a pumpkin vine grows. It does not jump from one place to another like the Irishman's flea; it is a process of growth. If you keep that in mind in the cases that have any prospect of a cure, I think you will have reason to believe that we are quite warranted in removing a section of tissue, getting a good histologic section, and acting upon that definite information.

Another point I want to make is this: Novocain and other local anesthetics have added enormously to our ability to handle these cases. They have simplified very much early operations, so that we can attack these cases without general anesthesia and with the cautery as Dr. Bloodgood has suggested. I am thoroughly converted to the use of the cautery, and I think in the ordinary case of an oral lesion such as he describes, the process of handling the case should be, first, the making of an accurate diagnosis by removing a section of tissue under novocain and, second, the removal of the lesion early with the cautery under novocain anesthesia. I think that is the secret of the future handling of these cases of epithelioma about the mouth.

I want to call attention to another fact and that is this: A great many of these cases come to us late. A poor devil comes into your office with a large, ulcerating epithelioma on his cheek, or on his tongue, or of his jaw. You look him over and almost any one could make the diagnosis of carcinoma. The thing smells carcinoma; it looks like carcinoma; it is carcinoma, and there can be no question about the diagnosis. What are you going to do for him; turn him out in the street with the statement that nothing can be done for him? By no means. We owe a very definite duty to these patients, and we can make them very much more comfortable for a longer period of time by proper surgical handling than with morphine, and that proper surgical handling is a recognized palliative operation from the start, and it may consist of ligating the external carotid on one or both sides with novocain, exposing the field wide, removal of the gross lesion with the Paquelin cautery or some other form of cautery under local anesthesia. It is perfectly surprising what can be done for these people in making them comfortable in the way of removing a large ulcerated mass from their mouth, thus sometimes increasing their weight from 20 to 30 pounds in the course of the next three or four months by one of these palliative operations.

Another point I want to make is this: I do feel that enough work has been done with radium and the X-ray to show that these agents are of great value in carcinoma of the mouth, largely if not entirely, in a palliative way, and that palliation which they offer is often of the greatest possible service.

The one great lesson Dr. Bloodgood gives you tonight, and the one great lesson he is carrying all over the country, is the fact that cancer is curable when it is recognized early; that cancer is under certain conditions preventable if we recognize the causes and eliminate them not only from the individual but largely from the community by education. And it is a lesson that is worth while, and one that I am sure is accomplishing a great deal of good.

Dr. Thomas L. Gilmer:

The Chicago Dental Society takes great pride in the fact that it has been able to induce one with such wide reputation as Dr. Bloodgood to come here to present a subject which is of vital interest both to the dentist and physician. I was not on the original program, therefore am poorly prepared to discuss the address, but will venture a word.

We cannot too earnestly emphasize the importance of early recognition of oral neoplasms. We have three dental schools in Chicago and in each of these the heads of the departments of pathology and surgery endeavor to impress upon the student body, at frequent intervals, the importance of thorough examination of all parts of the mouths of each of their patients to discover if there may not be present abnormalities or disease. If lesions or abnormalities are discovered, the patient is referred to the surgical clinic for further examination. By requiring this examination we hope to increase the student's knowledge of oral diseases, other than those connected with the teeth, and develop a habit at the same time which will be helpful in discovering malignancy before it is too late.

It is difficult, as has been said, to differentiate early, certain oral lesions, but I cannot conceive how a "gum boil" (alveolar abscess) could possibly be mistaken for carcinoma, since the history and clinical appearance is so markedly different. I have never known of a single instance in which alveolar abscess developed into a cancer.

We have long been taught that mechanical irritation in the mouth, such as broken teeth or irritating dentures, are potent causes of carcinoma. I have believed this fully, and it is with some timidity that I express an opinion in opposition to this theory. For a number of years I have been making careful observations to determine with some degree of certainty the relationship between mechanical irritations in the mouth and cancer. My opportunity for observation of oral lesions has been exceptional, since I have conducted a large oral surgical clinic for many years where I have seen many cancer patients, and besides, I have seen not a few cases in my private practice.

Histories given by patients relative to cancer of the mouth are not always wholly to be relied upon, especially as most patients reflect the professional theory, that constant mechanical irritation causes cancer. One question I ask a patient with cancer is, what first called your attention to the condition. The answer, in some instances, is, "The teeth became sore and loose, my dentist thought I had pyorrhea." In such cases the condition indicates that the disease originated in the gum tissue about the teeth in a location not susceptible to irritation by the sharp edges of the teeth. Others have said, "I had an ulcer on my cheek, the edges of the teeth made it sore." On examination of the teeth I have found, as a rule, that the teeth were normal in shape with no sharp edges. In such cases when the mouth is opened the swollen ulcerating growth impinges in the teeth, causing pain. Since the patient was not aware of the growth until there was pain he supposes the teeth are the cause of the disease, when in fact, the cancer had progressed to ulceration before it was observed. Again, the patient wears an artificial denture which is supposed to be the cause, but careful examination discloses the fact that the cancer originated some distance from the plate, perhaps in a leukoplakia patch, and progressed toward the area covered by the denture.

All dentists have seen inflamed buccal mucosa, tongue and gums, caused by sharp teeth or poorly fitting dentures which have extended over long periods of time, which promptly get well and remain well, as soon as the source of the irritation is removed. A broken tooth could not irritate the tissues between the junction of the buccal mucosa and the gum margins, and it is not uncommon to see cancer start in this area. I have been so impressed in the past with the theory that mechanical irritants are a cause of cancer that it is difficult for me to get away from that belief, though my observation and experience causes me to seriously doubt it. I feel that there must be some other cause, such as an undiscovered organism or something else, which as yet has not been discovered, which is the real cause of cancer.

Dr. Frederick B. Moorehead:

There are two or three things one might say in reference to the splendid address given us this evening by Dr. Bloodgood. In the first place, we owe him a debt of thanks for coming to Chicago with this message. I have known Dr. Bloodgood for a long time, and without emasculating my opinion of his ability as a surgeon, he has stood in my mind pre-eminently as an educator, probably because I have read of his work more in connection with the cancer propaganda, and if I should overlook the opportunity of speaking of his scientific ability as a pathologist and clinical surgeon, and think of him as an educator, I would be doing him no injustice, for a man who accomplishes something worth while in the world of education, certainly is deserving as much as the scientific pathologist or clinical surgeon. He is perfectly willing to give of his strength and time, his intellect and experience, in bringing to the attention of the people of this country such a serious thing as cancer. After hearing Dr. Bloodgood, one feels that the hope of the future is State Medicine. One might think of Johns Hopkins University as being under the control of the state in which it is located, and the laboratory with which he is associated as a place where the humblest citizen in that state may go and learn about cancer, tuberculosis, syphilis, and other menaces to the human family. I wonder when our institutions will be organized on a basis through which the common people may learn what public health means, the value of health as an asset to the nation and to the individual. Those who are connected with institutions of learning sometimes forget that they have a function equal to the clinical function, in drawing the attention of the people at large to the more serious questions of public health, and there is no question that is deserving of more educational emphasis than that of cancer.

I would like to say a word about the question of education of dentist and the physician in the subject of oral pathology. The dental student needs more of the fundamental biological sciences, and the medical student more practical knowledge of oral pathology. Theoretically many medical schools do this; practically, none of them do it. Dr. Bloodgood made it appear on the surface that the recognition of carcinoma was a simple thing. It is not simple. It is not difficult to recognize the well advanced cancer, but the recognition of cancer in the early stage is not simple. It was not difficult for Buffalo Bill to take a gun and shoot glass balls in a circus tent. After a good deal of experience Dr. Bloodgood and every operating surgeon learns by the sense of touch the recognition of cancer. He learns sight through his fingers. The general practitioner of medicine or dentistry does not acquire sufficient skill to render expert service in the recognition of cancer in its beginnings. If it be true, and we think it is at least partly true, that there is a potentiality in carcinoma in the form of preexisting irritation, then the message that Dr. Bloodgood brings us tonight points to the possibility of development at the seat of any point of chronic irritation, whether it be in a simple crack of the lip that does not heal for a long time, irritation produced by deposits on the tooth surface, irritation produced by a broken, fractured, or badly decayed tooth on the lip and the tongue, or the use of the pipe. One may have in mind the possibility of development of cancer at the seat of any chronic irritation.

There was one phase of the subject not touched upon specifically, and that is the development of carcinoma in the maxillary sinus. We have seen several cases of carcinoma, developing in the maxillary sinus that have been treated as chronic infection. I can think of three or four cases at this moment that were treated as chronic suppurative maxillary sinusitis until there developed a definite bulging of the bony wall. Did the carcinoma or infection begin first? Was the carcinoma superimposed on chronic infection, or did the infection occur after the carcinoma developed?

The least one might carry away with profit is that those who practice general dentistry should make a careful survey of every mouth and when he looks into the mouth he ought to see more than the teeth. The soft structures ought not to be overlooked. Any superficial examination anywhere in the body is dangerous.

As suggested by Dr. Gilmer, the so-called "gum boil" was doubtless misinterpreted by the patient. In the cases cited they were probably carcinoma from the beginning, although any pre-existing chronic infection, like a chronic alveolar abscess, might be an exciting cause of cancer.

Dr. Truman W. Brobhy:

When I heard that Dr. Bloodgood was going to deliver an address on this subject, I assure you I was greatly pleased. I have known Dr. Bloodgood for many years. I have written him questions which he has promptly answered. I have quoted him liberally, and by quoting him I have received many compliments about my writings, especially in regard to the things I quoted from him. He comes here to bring to us information that we so much desire.

In the first place, Dr. Bloodgood has stated that the greater number of oral lesions proceed from bad teeth. He is one of the surgeons of this country who recognizes the fact that the teeth more than any other tissues of the body are diseased. In other words, diseases of the teeth are more common than any other diseases known. It has been said here this evening and truly, that the teeth have been passed by in the medical curriculum. This brings us to the question of getting closer together. We know that in the past teaching in the dental schools on the subject of general pathology has not been thorough enough, and we also know that the teaching in the medical colleges on dental pathology, oral pathology, has been very incomplete. I am satisfied it is the desire on the part of educators in both medical and dental schools to give to the students the kind of information that will enable them to take better care of their patients.

It has been said that the precancerous or predisposing causes of cancer should not be neglected. For instance, cognizance should be taken of a gum boil. Anything in the way of a chronic irritation or inflammation from a dental abscess or any other conditions may eventually lead to cancer if neglected. A gum boil, so-called, ordinarily is an abscess. It is a sinus through which pus escapes from the abscess, and this chronic inflammation may be the beginning of degeneration of the parts into a cancer. I suppose it is well known that bad teeth, broken teeth, diseased teeth, caused the cancers which terminated the lives of both General Grant of the United States, and the father of the present emperor of Germany. Unquestionably diseased teeth were etiologic factors in bringing about the growth that terminated the lives of these great men. I mention these because they are examples of a great number of persons who have lost their lives by reason of diseased teeth, bad teeth or broken teeth. The lips are oftentimes irritated by bad teeth; the cheeks are lacerated by bad teeth, being really the initial lesion of cancerous development.

In the earlier part of the evening before we met here our friend Dr. Bloodgood made this statement that his interns (and this is no secret) labored under great disadvantages in reaching their findings in pathologic work for the reason that they did not know the names of the teeth. Sometimes they would designate a region where the growth had its origin as a cuspid tooth, when it really had its origin about a molar tooth and vice versa. This is the case in all schools in this country, so far as I know. If there is any one medical college in the United States that gives a thorough course in dental histology, in dental anatomy, in dental pathology, human or comparative, I do not know where that college is. It should be done so that men may recognize the diseases which have their origin in the teeth, and not make as many mistakes as they are making in these days regarding the beginning of cancer and other lesions.

For a long time I have been of the opinion that the teachings of Cohnheim regarding preexisting cells displaced were the cause of cancer in and about the mouth. We know how the epithelial lamina dips down into the submucous tissue and forms a loop, and how the enamel develops within that loop and how the unused cells which form the enamel are left drifting away into the submucous tissue. I have been of the opinion that these cells might lie dormant for years perhaps to an advanced age and then be stimulated into activity by means of a chronic inflamation, begin to multiply and by and by develop into a typical carcinoma.

Novocain has been mentioned as a most desirable agent to use in making these examinations. Formerly, before novocain was introduced, I always approached the taking away of a small section for microscopical examination with a great deal of timidity; it causes great discomfort, but since the introduction of novocain we can do it without any distress to the patient whatever.

I was specially pleased with what Dr. Bloodgood said in regard to avoiding mutilation. I have held, and will always hold, that every surgical operation should be performed in such a way as to leave the parts in just as nearly a normal anatomical condition as possible, and the surgeon who succeeds in removing tumors or what not with that in view, and with the least possible mutilation of the parts, leaving them just as nearly in a normal anatomical condition as possible, will be doing the best surgery and rendering the best service. In our operations about the face, I believe that one who is willing to spend the time will not be subject to any more inconvenience than he would be to make a large open incision in the face, doing his work thoroughly, and leave the patient's face without mutilation, without large external scars. We must remember that in taking away all growths our aim should be to do these operations intraorally. We cannot always do so. It should be our aim to do so, and we should do so whenever it is possible. As to taking away of a growth, these fibrous growths that Dr. Bloodgood has spoken of and pictured to us on the board, emanating from the gums, so-called epulis, there are reasons why these growths appear. They are not due to irritations of the gum; they are not true to the name *epi* upon and *ulis* the gum, but they are developments from the periosteum, and are due largely in my experience in nearly all cases to irritation set up about the necks of the teeth, possibly to deposits of salivary calculus, or if arising from the pericementum serumal calculus, or irritations of some kind from tobacco, or some other irritant that finds its way about the necks of the teeth, reaching the periosteum and thus exciting inflammation and hence the development of the growth. There is no other way to get rid of the growth except to remove it together with the periosteum and some of the bone beyond.

Personally, I wish to express to Dr. Bloodgood my appreciation of his coming here, and I trust that he may come often and give us the benefit of his large exprience in the investigations he is making, and the results of his treatment of this most dreaded condition—cancer of the mouth.

Dr. A. J. Ochsner:

The hour is so late that I will simply confirm what Dr. Bloodgood has said. I have followed his work for many years, and I believe there is no work that we can follow with greater satisfaction and with more certainty of going straight.

I wish to emphasize one thing that he has mentioned especially again in his remarks, namely, the fact that he removed these growths with the cautery. I believe that more patients have been free from recurrence because of that one element in the treatment than from all others combined, and that he insists, when a specimen is taken for diagnostic purposes, that that specimen also should be removed with the cautery. I have seen many patients who have died from metabolic carcinoma in cases in which portions of the primary growths had been removed with the knife for microscopic examination for the purpose of making a positive diagnosis.

Dr. Dean Lewis:

There are only one or two things I would like to mention in regard to Dr. Bloodgood's paper. First, this paper shows the futility of operations for carcinoma when the disease is fully established, and that if we want to cure carcinoma, we must cure it before it is carcinoma.

There is another thing about the etiology of some of these growths in the mouth, namely, that these preexisting lesions such as leukoplakia, predispose to cancer. Leukoplakia is by all odds the most frequent lesion, and I have been struck with the frequency with which a preceding history of syphilis can be obtained in cases of leukoplakia, and I think it is a combination of chronic irritation from smoking with syphilis that is the cause of leukoplakia.

Dr. Bloodgood has not mentioned how many cases of leukoplakia there were in which carcinoma was encountered. He has mentioned one case of leukoplakia with carcinoma developing in which a Wassermann was positive.

Another thing that has been rather striking to me is that Dr. Bloodgood, Dr. Bevan and Dr. McArthur have all emphasized so much the importance of a local operation in early lesions of the jaw; but neither one of these surgeons in a case of carcinoma of the breast, regardless how small the carcinoma is at the time of the operation, would think of doing an amputation of the breast without removing the lymphatics which drain that lesion. It is a little hard for me to determine the consistency of these three surgeons in dealing with carcinoma of the jaw because the lymphatic drainage from the gums and from the cheeks is certainly as abundant as lymphatic drainage of the breast. In any case of preexisting carcinoma of the jaw or carcinoma of the gum, it is incumbent on the man who does the operation to remove at the time, or preceding the operation on the jaw, the glands which drain the infected area. It is just as incumbent to do this in lesions of the gum and cheek as in lesions involving the breast.

I would like to say that we have statistics dealing with breast recurrences, and I would like to see how the statistics dealing with these lesions of the gum and cheek compare with radical removal of the glands which drain the infected area, and how they compare with statistics dealing with carcinoma of the breast.

Dr. Bloodgood (closing):

I am very glad Dr. Ochsner is here tonight because I owe Dr. Ochsner a paper, and I could not do both. I hope you will stand by me for doing this. I am now ready to help out Dr. Ochsner.

I am very glad Dr. Dean Lewis spoke about the removal of the glands. I was talking about the preexisting lesions, and I did not take up the subject of the glands, I merely alluded to it, but did not emphasize it, but in almost every case I told you the glands were involved or not. I believe with him absolutely in regard to the removal of the glands in lesions of the jaw in certain stages. We cannot go into that because it is purely of a surgical nature. I can give him exactly the relationship between involvement and gland recurrence. There is a stage and there is a lesion in the mouth where you do not remove the glands, but I believe if the cancer is fully developed, it is safer to remove the glands. However, there is a difference of opinion about that. In the case Dr. Ochsner operated on he did not remove the glands. That was the doubtful stage, but that is a very important surgical point.

I wish I had time to discuss all of the points that have been brought out, but time does not permit. I thank you.

SIXTIETH ANNIVERSARY OF THE ST. LOUIS DENTAL SOCIETY.

Planters Hotel, Nov. 16, 17, 18, 1916.
Saturday Morning, November 18th.

The meeting was called to order at 9:00 a. m., by President Loeb.

President Loeb:

Our speaker this morning needs no introduction. He is known, I am sure, to all here. Every one of us appreciates what he has meant to the dental profession. I want to present Dr. C. N. Johnson, of Chicago, who will talk on "Some of the Present Tendencies in Operative Dentistry." (This paper was published in the February number of the Dental Review, page 123.)

President Loeb:

Although we have arranged for no discussion of any of our papers, the asking of questions, provided they are pertinent to the subject, will be admitted for the next half hour or three-quarters of an hour, until the time at which the next paper is scheduled. I am quite sure that Dr. Johnson will be very glad to answer any questions, providing they are on the subjects presented.

Question: I would like to ask Dr. Johnson in what respect he regards alveolar abscesses in children's teeth along the ages of five to eight years, especially in the molars of such children's teeth; whether although they are in a diseased condition, they should be allowed to remain in that condition, i. e., should be treated and retained to the best of our ability until the permanent teeth are ready to erupt and take their place, or whether they should be extracted.

Dr. Johnson:

I would rather stand here and answer questions as well as I can than read a paper, but I want to warn you beforehand that you must ask me something I know. I often tell a story of an eminent gentleman from the east who came to our college when I was a student—that was just the other day, you know. He was a man of great reputation. When he got before the class, he said, "Now I have not prepared anything, but I want you to ask me questions, which I will answer." We wanted to know, on what subject. He said, "It does not make any difference what subject;

I am just like a full beer barrel, you can tap me anywhere and you will get something." I want to announce that I have to be tapped below my information line.

The question that was asked by the gentleman is a very important one. It is a question for two men to decide, the operative dentist and the orthodontist. I will tell you what I think from the point of view of the operative dentist. These teeth at five years and seven years, the deciduous molars, should be retained in the mouth if they can be retained in a healthy condition; and ordinarily they can, even if there is an abscess—that is, a sinus opening—because there is no class of cases that I know of that will respond so quickly and so easily to treatment of that condition as will those deciduous molars. And I think that if an orthodontist were talking upon this subject, he would ask you to keep them there if at all possible in order to maintain the space. If those teeth are extracted too early, you are very likely to invite an irregularity. If you will take those little children and treat them carefully, you can as a rule clear up those conditions. I am not talking on the technical part of this question, simply on the general aspect of it.

I would not keep an abscessed tooth in a child's mouth that could not be cured, but I am going to announce today that I have more faith at the present time in curing those abscesses, both in deciduous and in permanent teeth, than I had a year ago. In this connection, I will say that not all the abscessed teeth that come to my office are extracted.

Question: I think I will be able to ask a question that is pertinent. Dr. Johnson has mentioned the X-ray. I would like to have him state his opinion upon this phase of the subject: Do you believe that the X-ray should always be in the hands of the specialist, or do you believe that the future of X-ray development, so far as it affects our line of practice, ought to be in the hands of the dentist?

Dr. Johnson:

Dr. Lischer has brought up a very important question, and it is the one question of all others connected with the X-ray situation that has made a very vivid impression upon me. The situation today in most cities—in Chicago, at least—is this: When the importance of the X-ray was first recognized many men started to making X-ray pictures for the profession of medicine and dentistry; most of those men knew nothing whatever about medicine and nothing whatever about dentistry. Now up to that time they were not to blame, but what I do censure them for with all the energy of my might is that they make a diagnosis from the X-ray picture and even write that upon a card and hand it to the patient. That is a serious wrong. It is not only a wrong to the medical man or to the dentist—it is wrong enough to them—but it is an infinitely greater wrong to the patient. By virtue of that offhand written statement, "abscess of the root," "infection at the root," etc., an impression is made upon the patient that cannot be eradicated afterwards, and many a good tooth has been taken out as the result of that kind of a diagnosis. No man should make a diagnosis by an X-ray picture of a tooth unless he knows something about dental pathology and dental anatomy, yet they are doing it all the time.

If you will pardon me just one minute, I will give you a practical case that illustrates what I mean. A few weeks ago a gentleman stepped into my office with an X-ray picture of a lower molar on the right side. He said, "Doctor, what do you find there?" I said, "I do not find anything wrong." "You don't?" I said, "No." Well, instantly that patient knew more than I did because he said, "Why, there is an abscess at the root of that first molar." I looked at the picture and said, "Who told you so?" "Why," he said, "the X-ray man told me so and the medical man told me so." I said, "It is not possible that they told you that." Then he pulled a statement out of his pocket, written by the X-ray man: "Abscess of the root of the first molar." That was verified by the medical man. Then he told me this: "I have been having trouble with my eye. I went to an oculist and he sent me to the X-ray man, who said, 'There is an abscess here' and sent me back to the medical man and he sent me to have this tooth out." I usually try to be charitable, I usually try to hold myself, but I did not that time. I said some things that I am ashamed of now, but I am glad I said them. (Laughter and applause.) I said to him, "There is no abscess there." Then I saw that the man doubted my judgment when it was pitted against the judgment of those two men. He said, "Doctor, this is a serious matter to me; I have been having trouble with my eye for a long time, no one has been able to find the source of the trouble until now when they say it is this abscess."

I said, "I cannot agree with them; I would not agree with the whole medical profession and the whole dental profession on that question if every one opposed me, because it is not my conviction. Now to relieve your mind I am going to do a little investigating. By the way, how long has that filling been there?" "Why," he said, "I have lived in Chicago forty years and it was placed there before I came here." I said, "Well, I will take it out; there may be dead pulp in there."

I took that filling out, and found as beautiful a live, healthy pulp as I ever found in a tooth. "Now," I said, "I have done you more harm than good except that I have relieved your mind. Take this back to the X-ray man and the medical man and tell them what I found." That tooth had no more to do with that man's eye trouble than a rooster crowing has to do with the transit of Venus.

Now to answer Dr. Lischer's question, the time is coming, provided we demonstrate just how much we can tell by the X-ray, when each man must have an X-ray in his office or he must have his X-rays made by a man who is careful and conservative.

Question: We got off the children's teeth subject just a little too soon to suit me. I have found in my practice just what Dr. Johnson states, but there seems to have been a difference of opinion as to what takes place after we have arrested suppuration or the abscess and have made the tooth comfortable. I would like to ask Dr. Johnson, does he believe that absorption of those roots goes on, or should we assist? That I have sometimes done by each time the child comes back to me shortening the occlusal surface of that tooth, with the theory that the absorption has been arrested at the other end.

Dr. Johnson:

I said you would have to tap me below the line. The late Dr. H. J. McKellops of St. Louis showed me a case of a deciduous molar in which he had filled the roots with gutta percha and after years the roots were perfectly absorbed, leaving the gutta percha points sticking out and that tooth fell out with those gutta percha points in it. That answers the whole question.

Question: You said, if I understood you correctly, that no one excepting a dentist should make a radiograph. Now do you really mean that? It seems to me that the man who can make the very best possible pictures is the man that should make the radiograph, not necessarily a dentist.

Dr. Johnson:

I am glad that question was asked. Mr. President, I want to make myself clear. I have no objection to those men making radiographs, but I do strongly object to them making a diagnosis. Let them give us good X-ray pictures, as good as they can, but let them give us the privilege of making the diagnosis. We may have handled the patient for years; we have just as keen an interest in that patient as any one can, more than the X-ray man can have, and it should be our privilege to study that case and make a diagnosis. But to have placed upon a card and handed to a patient the statement that there is an abscess here or an infection there, is something that I strongly object to. We want the best X-ray pictures that we can have. I think that when dentists have had more experience in making X-ray pictures that they will be more skillful in making X-ray pictures of the mouth than any others. I have no X-ray outfit myself, but I want to tell you that I insist that those to whom I send patients shall not make a diagnosis and hand it to the patient. I had to give up a tooth the other day, an important tooth, a lower bicuspid with a full arch otherwise, and that tooth had to be extracted not because there was anything seriously wrong with it at all, but because of a mental impression made on the mind of that patient by the X-ray man, who is not a dentist, that there was infection there.

Question: I would like to ask Dr. Johnson what, in the absence of external indications of trouble, would be a guide for a country dentist to consider himself warranted in sending a patient to an X-ray man.

Dr. Johnson:

The position of the country dentist in this matter is a most difficult one. I should want to check up on that patient with the X-ray, but if I sent a patient to the X-ray man I should insist that that X-ray man refrain from diagnosing that case to the patient. I want to tell you that there is not a man in this room, and I think that there are some of the smartest men here in X-ray work that we have in the profession, who can tell absolutely by the X-ray alone what the condition is at the end of a tooth.

Question: Dr. Johnson referred in his paper to the co-operation between physician and dentist. I would like to ask if he has a suggestion whereby we may become better acquainted and may co-operate with the physician in a better way.

Dr. Johnson:

You are getting pretty nearly below the line that I spoke about. I might make this suggestion, that if we frankly and cordially meet the medical man and prove to him that we have been doing some thinking on this situation, that we know something in the first place about dental pathology and meet him in that attitude, it is my belief that the medical man will gladly meet us and the barrier that has been between the two callings will gradually be broken down. It will not be broken down all at once. As it is today, the medical man in too many instances goes through the same routine that I referred to. He sees a patient who is ill and this, as I said before, being the medical era of teeth, he sends the patient to an X-ray man, and frequently the X-ray man refers back the pictures to the physician with his diagnosis, and the physician in most of these cases will acknowledge that he is not familiar with conditions surrounding the teeth and naturally wants the cause of the disease taken away, so orders the tooth to be taken out.

Now what we must do to stop that practice is to publish articles, to go before medical societies just as we have invited medical men to come before our societies, and then let us present our point of view in this matter in a wholly charitable, magnanimous, gentlemanly and scholarly manner. Then we will get the coöperation of the medical profession. Abuses will still continue, but by that kind of propaganda abuses will be fewer in the future than they have been in the past.

We need the coöperation of the medical man. His diagnostic point of view is broader than ours. Unfortunately, we have been working with small things; we have thought of nothing, most of us, but of that abominable little thing, a cavity in a tooth. We want the breadth of view of a physician, we need that badly; and in this particular field he needs us just as badly as we need him, and God knows the patient needs us both.

Question: I want to ask Dr. Johnson what he would do about such a thing as this. To my certain knowledge, during the past twenty years, there has been a physician in St. Louis, possibly more than one, who is a specialist and is in the habit of sending a patient to a dentist with strict orders to extract such and such teeth, regardless of the condition of the tooth, but more especially if that happens to be a pulpless tooth that has been perfectly and properly treated and has been comfortable for years and years. Yet he will send a strict order to the dentist to extract that tooth. What would Dr. Johnson do under those circumstances?

Dr. Johnson:

I will tell you what I did in one case, and this is a typical case. A gentleman who had been my patient for about ten years, who previously to that had been the patient of the late Dr. J. N. Crouse, who did excellent work. This man had thirty-two teeth in his mouth, a man of forty, came in one day and he said, "Doctor, do I have to have all my teeth taken out?" I said, "No, what is the matter?" "Well," he said, "I have just been told by my physician," and he mentioned one of the best physicians in Chicago, "that I must have my teeth taken out." "Well," I said, "on what evidence, for what reason?" He said, "He has had X-rays taken; I have not been feeling well, and he has had these X-rays taken and he says that I must have my teeth extracted."

I examined those X-ray pictures carefully and conscientiously, and I said, "No, that is not my judgment." The man was depressed over the fact that he had to lose his teeth. "That is not my judgment," I said. "Well," he said, "he won't treat me if I don't have my teeth extracted." I said, "Yes, he will; I will call him on the phone and have a talk with him. I want to help him and want to help you, but I do not believe that your condition would be better if all your teeth were extracted."

I called this physician on the phone and had a talk with him. I said, "Doctor, I will gladly coöperate with you in regard to this patient. I will remove the fillings from certain pulpless teeth. I take it that they were well filled, but I won't overlook anything. I will promise you on my part to put that man's mouth in good shape. I cannot find enough indication for removing all these teeth. There is a little surface gingivitis, no pus can be expressed, but a little surface gingivitis which will be cleared up readily." "Well," he said, "Doctor, in those X-rays there were certain lines," and he described to me lines that you could not help but get in an X-ray in the most normal mouth in this room. And that frightened me, to think that on the strength of such findings they were ordering teeth taken out, for you cannot take a picture across, for instance, the upper jaw without getting a line at the floor of the antrum. He described those lines and called them "lines of infection," and I said, "Doctor, those lines are normal in there." I said, "Look at the X-rays of a number of mouths and see. Now," I said, "let me tell you that I do not look lightly upon this situation. I want that man to be well. I will do my part, but I do not believe it will be a good thing to have all those teeth extracted."

The next time that patient came in he told me that the physician had sent him to another dentist, a dentist who would take a man's leg off if there was an ingrowing toenail and this physician told him to. "Now," I said, "I have to take a position in this matter that I have never taken before. You cannot go to that dentist and remain my patient." As I said before, the dentist was one who would do whatever the physician told him to do without regard to his own opinion, and I did resent that physician sending my patient to a man who would do his bidding no matter what he thought. I said, "I am not going to accept any more responsibility in this matter. Take these X-rays and go and consult a half dozen dentists and get their verdict and let me know what it is. Go to any dentist you want, you have been here long enough to know who they are."

He went to several men, came back, threw the X-rays on the table and said, "I am done, I am not going to have those teeth out. I am not going to have anything done." "Oh, yes," I said, "you are. I am going to take those fillings out because I do not wish to be held responsible if you do not get well." I removed a filling from a lower bicuspid, one of the teeth that was condemned, and I am going to mention a peculiar thing. I would not have believed any man—well, I would believe what Dr. Gilmer or Dr. Marshall had to say about anything, but it would have been hard for me to believe this. I found in the apical third of that root live pulp tissue. That tooth must have been filled for more than ten years, because he had been my patient for ten years and Dr. Crouse had been his dentist before that. That canal was filled with oxychlorid of zinc.

Just at that time the patient was called out of town, and had to go away time after time to New York on business, so that I lost trace of him. Quite a while afterwards, he called up one day and asked for an appointment. He came in. I said, "How are you feeling?" "I am feeling fine. I found out what was the trouble with me." He was a big, heavy man and a hearty eater. He sat at his desk all the time, got no exercise whatever, and not only that, but if he read an advertisement in a paper about gall-stones he would have gall-stones in five minutes' time. Then he was compelled to be busy and get about and he forgot to be sick. I afterwards put his mouth in as good condition as I could. That man has been in perfect health since that time.

But I want to pay this tribute to his physician. He did not like me at all for a while, but after the man had had these New York trips, after he had got out of doors, had gone down to the athletic club and taken some exercise, his physician gave him a looking over and almost kicked him out of the office for being so well. And I also had the satisfaction of having the wife of that man come into my office later and thank me for the position I took in that case. I want to tell you that it was no light responsibility. I might have been wrong, but I did not believe that I was wrong; and I want to tell you, Dr. Marshall, that when it comes to the point of doing whatever I believe is right in connection with the teeth, I am going to do it in spite of the medical profession and in spite of the radiographer. (Applause.)

QUESTION: Mr. President, I want to ask a side question of Dr. Johnson, because he mentioned just now the giving of radiographs to patients. I want to ask his opinion of giving, as a rule, radiographs to patients, even discussing the radiographs with a patient and showing them to him. I am opposed to that, and I would like to know his viewpoint. I think there is a possibility of getting into considerable trouble through giving radiographs to our patients.

DR. JOHNSON:

The routine of having X-ray pictures taken I think should be this. That if you deem it necessary or advisable to have a radiograph taken in a mouth and you do not have a machine yourself, send that patient to an X-ray man in whom you have confidence. That patient goes and has the X-ray made. Those X-rays do not go to the patient, but they come to you. If that X-ray man finds anything there that he fears you will overlook, and he will frequently do that, let him write you or call you up and tell you what he thinks he has seen, and then you do your own thinking. Then, when the patient comes back to the office, you may want to show them to him and you may not. You may want a tooth extracted and the patient may object, and you may want to show them as evidence why you think that tooth should come out. The patient has that right. But never have a patient go to an X-ray man, as I have had done many times, sent by a physician, and get the X-ray pictures with those notes written all over them.

QUESTION: I would like to ask Dr. Johnson a question that has been a weight on my mind for two years. I had a patient come to me who was very anemic, and she had a well developed case of pyorrhea, a very cleanly patient, too. I treated that case for about four weeks, and it showed improvement. However, the anemia was not much improved. About that time her physician advised that she go to a hospital. She went to the hospital, and while there she called in her old family physician who had been treating her years before. He advised that all of her teeth be taken out, and he took them out in the hospital. About five or six days later, the patient died.

I want to know whether I was at fault for not advising that, or whether by opening up new avenues of infection this procedure brought about her death.

DR. JOHNSON:

I want to say, in all seriousness, that nobody can tell who erred in that case. It may be that nobody erred. That patient may have died just the same if those teeth had not been taken out, but I have heard Dr. Gilmer say so many times not to extract a whole lot of teeth when a patient is in that condition, and I wish men would remember those things and be careful and conservative and not open up, as the gentleman said, new avenues of infection.

We must study these problems with the sole idea in mind that we are going to help the patient and not to bolster up some theory of our own.

BANQUET TENDERED TO DR. EDMUND NOYES BY THE CHICAGO DENTAL SOCIETY.

Post-prandial proceedings at the Fifty-third annual meeting of the Chicago Dental Society, held at the Hotel La Salle, Chicago, on the evening of January 27, 1917. Dr. George E. Poundstone, president, toastmaster.

After the rendering of various vocal selections, Dr. George E. Vincent, president of the University of Minnesota, was introduced by the toastmaster, and delivered an address on "Crowd Psychology."

Toward the close of his address Dr. Vincent, speaking in a more serious vein than had characterized the preceding portion of his address, said:

My friends, if at the outset I spoke derisively of that little, narrow margin of difference which we call individuality, let me in conclusion exalt it as the most precious thing in human society. What would happen to us as a nation if tonight we could be made alike in taste, in knowledge, in ideals, in everything? It would be the end of all progress. What is the hope of any nation and the hope of the world? It is to be found in that little, narrow, but by no means negligible margin of difference, which is called individuality. What is the hope of your profession? Is it to be found in that which you all know, which you all agree upon, which represents the great central achievements of your science and your art? No. It depends upon your little margin of imagination and of genius and of leadership, which all the while is at work enriching and making your art and your profession a finer, a nobler thing for you, as individuals, and a greater benefit to mankind.

Ah, individuality is so precious a thing that in our education, in society everywhere we should encourage individuality. We individual men and women should remember that civilization has not been swept through the centuries on great waves of emotion. No. It has been built up like the coral reef, by minute contributions of individuals, who have dared to stand for truth as they saw it. Remember, the truth is too great a thing for any one mind to compass. What we have today, which has been handed down to us from the past, is not to be traced to any one individual. It is the contribution of millions of individuals, most of whose names are no longer remembered, but whose contributions are a great part of your brain cells today, whose contributions are organized into the skill of your hands. When we remember what human society is and when we remember how it has been built up by individuality, let us do all within our power to encourage individuality. I do not mean by that to encourage excessive egotism; I do not mean by that to exalt our personality to a point where we are not willing to work for others. I mean something very different. I mean that loyalty to society which finds expression in clinging steadfastly and courageously to that little fragment of truth which has been revealed to you and to you only. You can do your duty only as you are faithful to that vision, only as you cling to it, only as you study it over and over, that you can make sure that it is not being neglected by society, when it ought to be adopted and passed on into the future.

But you say, has sentiment no part in human life? Indeed it has. Until men make love by logic, until they cherish their children from calculation, until policy spells patriotism, sentiment will bind men together, and under the right leadership will carry them on to splendid achievement.

But remember, sentiment is safe only when it is under the control of conscience and reason. Exalt these two, keep them always in control, and then sentiment becomes one of the most beneficent of human forces.

Ladies and gentlemen, if I have jocularly and lightly dealt with some phases of human nature, do not misunderstand me, as in conclusion, with all seriousness I make the plea for individuality, for conscience, for thinking things out by ourselves, and then standing by the truth as we see it, in order that we may achieve our own personal lives, in order that we may make our largest contribution to the age in which we live, in order that we may be of the greatest service to generations yet unborn.

(Prolonged applause.)

(After another vocal selection, the toastmaster read a telegram from the Marquette University Dental Alumni Association, extending a special invitation to the Chicago Dental Society to attend their clinics to be held on Thursday, February 15th.)

The Toastmaster:

We now come to one of the pleasant features that occasionally take place in a meeting of this kind, to do special honor to one of our own members, to one of our own friends, to one of our own personal family as it were; and it is a great pleasure to me and to all of us here to be able to extend our appreciation and our best thoughts and our best wishes to one who has lived and labored among us for so many years, as the one to whom we do honor tonight, Dr. Edmund Noyes (applause).

I know of no man in the dental profession, in the Chicago Dental Society or in our Illinois State Dental Society who deserves more credit or more praise for the excellent work and the excellent life that he has given us.

His example is one that stands out pre-eminent among all of the men of this state, for a great length of time, and it is those men, men of this kind, that love to get together and to do honor to him.

The first toast to Dr. Noyes comes from his brother, Dr. William A. Noyes, and as Dr. William A. Noyes cannot be present at this meeting I shall read the letter that we have received from him:

January 24, 1917.

Dr. Edgar D. Coolidge,
Chicago Dental Society,
25 East Washington street,
Chicago, Illinois.

Dear Dr. Coolidge:

It is with a very keen regret that I find that my engagement in Oklahoma will prevent me from being in Chicago Saturday night.

I should like to tell you something of how my brother came west as a lad of 14, and from that time took his place, almost as a man, beside our father and mother in breaking the virgin soil of Iowa, and building a pioneer's home on the prairie. One of my earliest recollections is of a snap-gun which he fashioned for me from a pine stick, and I well remember the careful way in which he finished it, scraping it smooth with a piece of broken glass—a forecast of the artistic way in which he has carved the teeth of his patients for fifty years or more. The gun was absolutely harmless, though I used it in war times to shoot Jeff Davis—but he taught me that I must not point the gun at any person or at anything I did not wish to shoot. I think you will recognize in the picture one who has endeared himself to all who know him by his careful thoughtfulness for the welfare of others. He was my "big brother" in those days, to whom I looked up in admiration—a feeling that has not grown less as the years have gone by. I might go on to speak of the flitting from home to a neighboring township to teach a district school before I can remember, and then to Dubuque to begin the work of his profession—but I only wish to bring a word of tribute from a brother, to whom he grows closer and dearer each year of his life.

Yours very sincerely,
W. A. Noyes.

The Toastmaster:

I also wish to read another letter from a man whom you all know. If you do not know him personally you surely know him by reputation, Dr. Garrett Newkirk. He has sent the following letter to Dr. C. N. Johnson:

Pasadena, Cal., Jan. 16, 1917.

Dear Dr. Johnson:

I wish to add my little share to the tribute to be given Dr. Edmund Noyes by the Chicago Dental Society, Jan. 27th.

I first met Dr. Noyes at a meeting of the Illinois State Dental Society in 1880 or '81, when he was secretary of that organization. He inspired me with respect and confidence at once, which has never waned, but increased from that day to this.

I was then practicing in a small country town, and there had come under my observation a short time before some gold fillings that excited both admiration and envy; for they seemed to me the finest I had ever seen. They anticipated Dr. Black's theory of contour, and "Extension for prevention," and they were beautifully finished. Their owner, a lady from Chicago, had told me they were placed in her teeth by Dr. Noyes. In presence of Dr. M. S. Dean, the beloved, I told Dr. Noyes of my seeing these specimens of his work. "There, Doctor," said Dean, "you see how your fame is spreading," and I have never forgotten how Noyes blushed. He was a good deal younger then than he is now, but the same, true, honest man, whose middle name might well be *Faithfulness*.

Truly yours,
Garrett Newkirk.

The Toastmaster:

Such testimonials as these, and others that we have received and of which we hear verbally day after day, and such as I have heard year after year through my association with Dr. Noyes, have made his name extremely dear to me, and to all with whom he has come in contact. I will not take more of your time now as we have others who have known him longer than I have, and who are to speak on certain phases of Dr. Noyes' life and work.

It gives me pleasure at this time to introduce Dr. M. R. Harned, who will speak to you of his society work.

Dr. M. R. Harned:

Mr. President, Dr. Noyes and Ladies and Gentlemen: When Dr. Coolidge asked me to respond on this subject, my censor and adviser, Dr. M. L. Hanaford, was not present or I should probably not have replied, "I shall be delighted." I was not so fortunate as a certain Scotchman. You have heard the story of the two Scotchmen, perhaps, who were cast adrift by a wreck, and were floating in an open boat, and after several days of drifting they became desperate and one of them got down on his knees and began to make promises to the Lord, and after making several his friend said to him, "Hauld a bit, MacDougall, I would na gae too far. I think I see land." Had I had this advice, I might not have succeeded Dr. Vincent on this occasion.

Recognizing the tremendous turmoil that exists in Europe, I take it that this is a happy week for all the citizens of the United States, but particularly for the dentists of the United States. First, we are happy because we are citizens of the greatest republic on earth, from which emanated the great proclamation in the way of a message to Congress last Monday, which one of the older senators pronounced "the greatest proclamation since the Declaration of Independence in 1776." This was, however, a much greater proclamation, in fact the greatest proclamation that has ever been made to any Congress, a proclamation of the interdependence of all nations, which stamps as our world's greatest pacifist, our president, Woodrow Wilson.

We are especially happy tonight to be here and to do honor and to pay our respects to the greatest pacifist of the dental profession, our beloved Dr. Edmund Noyes. (Applause.)

It gives me great pleasure to participate in honoring on this signal occasion a man who has specialized in nothing by which he attempted to do wonderful things, but in doing little things, the thing at hand, the every day things, so well that he has made them conspicuous and beautiful. And I rejoice in this opportunity also to pay my respects to one who has set an example so near and dear to all of us that it seems possible for any of us to attain it.

Again I rejoice in participating in this because I love Dr. Noyes.

But I was to speak to you upon his association and society work, which has extended over a period of approximately fifty years. This seems like a long time to contemplate in the foreground. He joined the Chicago Dental Society in 1868. I am not informed as to whether he was a charter member or not. That is forty-eight years ago, or possibly forty-nine. He joined the Illinois State Dental Society in 1872 and the American Dental Association in 1877. He joined the Odontological Society and was a charter member, in 1883. He was a charter member of the Odontographic Society which was formed in 1888. He became a member of the Northern Illinois Society in 1891. He is now president of the North Shore Branch of the Chicago Dental Society. He has served as president in all of the dental societies of which he is a member, except the American Dental Association and the Odontographic. The latter he declined.

His great work has really been done in connection with the Illinois State Dental Society. He served as secretary for five years. He has been editor of the Transactions since 1904, and he has always had a place and done efficient work upon some important committee. He has presented just an even dozen important papers to the Illinois State Dental Society. I do not think it is necessary for me to read the names of them. They are all characterized by the painstaking and efficient, "Know what you say" element which is characteristic of Dr. Noyes; and this is embodied throughout all of these addresses. He has participated in discussions almost without number. So great are his contributions to the Illinois State Dental Society and other societies that it would be tiresome for me to attempt to enumerate them.

Not the least of his contributions, however, to the dental societies does not appear upon the record from which I took this, which was the report of the Golden Jubilee of the Illinois State Dental Society in 1914. As I say, one of the most important and one that does not appear in the records among his contributions, is his son, Dr. Fred Noyes. (Applause.)

His discussions have always been of a character which gave the young man an opportunity. If he ever criticized a paper it has been done in such a beautiful, kindly spirit that the essayist seldom knew that he was really criticizing him. He was only asking questions and getting information, when in reality he was almost, if not quite, an authority, upon the subject.

He always in his relations in the dental societies has acted as if every one were his boy, and instead of criticizing him he was trying to help him, and I am sure that there are many here who feel just as if we were his boys. At least we would like to be recognized as such. He has been so kindly and so beautiful in his relationships with us, so tender and so thoughtful, that I am reminded of what Edward Carpenter says, and he really makes it seem possible to almost any one, it seems so natural for him. Carpenter says:

"Is there one in all the world who does not desire to be divinely beautiful? To have the most perfect body, unerring skill, strength, limpid clearness of mind, as of the sunlight over the hills. To radiate love wherever he goes, to move in and out, accepted? The secret lies close to you, so close, deep down within—yet in time it shall come forth and be revealed."

And so I would apply these words to Dr. Noyes. (Applause.)

(The Toastmaster read a letter from Dr. C. E. Bentley.)

January 27, 1917.

My Dear Dr. Noyes:

Although I am sick and house-bound, I cannot let pass an occasion such as this testimonial to you without adding an expression of my appreciation of you as friend, and my gratitude to you as teacher and guide. My years with you as a student have left on me an indelible impress, and what good I may have achieved and what right standards I may have attained as a man and dentist, can be traced to those early impressions made during a plastic period.

As friend and co-worker for many years of professional life, contact with you has but increased the love and reverence which were felt in old college days. I know that the sentiments which I so stumblingly express are felt by all men who have touched you in your honorable professional life. The profession to which we have given our love has been enriched and strengthened by your ideals and your work. Your ethical purity, your sanity and honesty have been an inestimable asset in the warfare which we wage for all that is good and noble in dentistry. For these things we love you—for them we are greatly indebted to you, and no man feels this affection more strongly or acknowledges this debt more gladly than

Your old student and friend,
C. E. Bentley.

The Toastmaster:

There is another man in the dental profession who has been closely and intimately associated with Dr. Noyes for many, many years, and we now wish to hear from him, especially in regard to "His College Work," Dr. Donald M. Gallie.

Dr. D. M. Gallie:

Mr. Toastmaster, Dr. Noyes, Ladies and Gentlemen: I wish to express my pleasure in having the opportunity of taking part in helping to honor this dear man whom we gather here tonight to pay some tribute to.

I have wondered why I have been selected to respond to this toast. On occasions of this kind when we come together to pay some tribute and honor to one who has served us so well and has done so much for our profession, it always brings to my mind that story that many of you have no doubt heard, but I think it always bears repeating, because it is so pat and fits in so well on an occasion of this kind. Dr. Lawrence whom we have always considered as the chaplain of the dental profession in Chicago tells this story on Francis Murphy, the great temperance reformer and lecturer. Upon one occasion he was addressing a tremendous audience in a section of a great city where the poor were more numerous than those who were in better circumstances. A great revival was going on in that section. The auditorium in which he was speaking was crowded, and in the enthusiasm of the occasion, hymns were sung, and during the singing of one hymn a little toddler got up onto the platform, with a little ragged shawl around her shoulders, a little girl with an emaciated face and skinny legs, and toddled toward him and handed him a little bouquet. He said, "Stop the singing," and as they stopped he said, "I want to tell you folks that I would rather have this little girl come onto the platform and give me a little nosegay than to have my friends send a carload of roses and tube-roses to throw on my coffin and say, 'Murphy, smell them.' "

So I am happy to say that the time has come when we do not wait for our friends to pass the Great Divide, but we now have the privilege of paying them some honor and saying a word of love and esteem to them while they are alive. (Applause.)

I can hardly understand why I was selected to respond to this toast. While, of course, at first glance you will not see much difference in the appearance of Dr. Noyes and your humble servant, nevertheless there is some little difference. I think perhaps it is because we both started on our careers together, he on the career of dentistry and I on the career of life, because he started, as I understand it, in 1866, and I started to make trouble on this globular planet in the same year. (Laughter.) I thought perhaps I was selected because I was a fellow alumnus, I suppose most of you know, although there may be some that do not, that he received the degree that few ever receive in this town, the honorary degree of Doctor of Dental Surgery, in the first class of the Chicago College of Dental Surgery. As a graduate of that school, I thought perhaps it was for that reason that I was selected to respond to this toast. And then I thought it might be that I was seleced because when I started in on my dental course, I had the privilege and the advantage of having a seat next to that distinguished son of his who is following in his father's footsteps, and doing so much for the profession of dentistry, Dr. Fred Noyes. (Applause.)

Then I decided that it was for the reason that Dr. Noyes starting as he did, so far back, and I graduating twenty-five years ago, I thought perhaps the committee considered it would be fitting for me to act and to appear as a sort of connecting link between Dr. Noyes and his confreres and the young men of today, who are inspired and stimulated by the example set by such men as Dr. Noyes and his contemporaries. (Applause.)

I was to speak in regard to Dr. Noyes' activity in college work, and on account of the absence of his brother, the chairman of the committee asked me to say a word about Dr. Edmund Noyes himself. Who is this man that we honor tonight? I would say he is the dearest and sweetest character we have in our midst, and there is no man in our profession in the country or world today who more perfectly typifies the highest ideals of the professional man. (Applause.)

From certain data which I received only late this afternoon, about his early career, I find that he, like many others who came out from the east to help in the winning of the west, came out from Boston, the Cradle of American Independence and Culture, born in a little town near Boston, in the year 1845; he came west to make his way, and to have the west benefit by the heritage of these great men which Massachusetts has given the west, a Christian character, a cultured mind, and an ambition to do the best for himself, and for all those who came in contact with him. When I read those data, I could see that his way was not an easy one His way was not as easy—and I might digress by saying that he has had nothing but hard work, and has lived naught but an honest life, different from some of our friends who are prominent on account of their success and on account of their business acumen.

The story is told of an automobilist who was driving at a rapid rate and was heedless when approaching a train and paid no attention to the warning whistle of the locomotive, and he was struck, and the machine was overturned and he was pinned beneath it. Regaining consciousness, he looked up and saw a Jew standing by him. The Jew said to him, "Hit by the locomotive, yes?" And he dully and weakly nodded his head in affirmation. "Did any one see it?" He shook his head, no. "Has the adjuster been about?" Again he nodded in the negative. "Well," he said, "you vill not mind if I crawl in and lie down beside you?" (Laughter.)

Dr. Noyes did not get his living that way. He has earned his way honestly in the world.

We see him leaving the town of Abingdon, trekking across the prairie by prairie schooner; his family settled in a little town near Independence; and, as Dr. Noyes' brother intimated in his letter, he was the one who provided largely for the family, and for years he worked on the farm, and he went to school for thirty-six weeks all told in that section of the country, and then taught school and solicited subscriptions for a war magazine or a war book, and then he entered a dental office as an apprentice in 1865; and in 1866 he entered the Ohio College of Dental Surgery, the second oldest in the country. He followed the course there for just a year and then he came on to Chicago in 1867. He is today the dean of the dental profession in Chicago, he having practiced longer than any other man in time of practice, and many, many changes indeed he has seen. From the time he came here he has left his imprint, he has left his influence; he has made his mark upon the profession. When you consider the profession of dentistry, it has had interesting centers of development and advancement; and when you stop to think, we look upon dentistry as a modern profession, because it has only dated back until about 1839 when they started the first college in Baltimore; and when you stop to think of that, and consider the time that Dr. Noyes entered the profession, you can see that he has been practicing dentistry two-thirds of the time to which we have dated back as the birth of American dentistry.

Many changes indeed he has seen, and his place in Chicago is like the place made by other men in the great dental centers of the country. When we think of Baltimore, we think of Harris and Hayden and their colleagues; when we think of Boston we recall Nathan, Cooley, Reef and Chandler and Hitchcock and Shepard; when we look to Philadelphia we think of the Truman, of Flagg and of Garretson, and of Darby, and such men; and when we come to New York, there were Atkinson and Westcott, Dwinelle and Perry. And then nearby, we had another great dental center, and the men who met there made their mark and left their imprint on the profession, in the city of St. Louis; and there we had Homer Judd, Eames, Chase, McKellops, Morrison, Fuller, and men of that type; and right close by was another center, younger than all of these, because it had a later start, this great center here in Chicago, and we have Dr. Noyes taking his place among the men here. When we remember that he started here with Dean and Crouse and Allport and with Black and with Cushing and Harlan and Swain, indeed we should feel that it is a blessed privilege to have this man who was a contemporary of the men whom I have mentioned with us tonight, so that we may do honor to him. (Applause.)

For the first fifteen years of his life he did everything he could to encourage young men to take the course in the schools that he felt would give them the education that was required for the practice of dentistry, because away back in those years Dr. Noyes had a vision. He could see what dentistry would be. He could see what would be required of the members of our profession.

In 1883 or 1885, when the first work was started to organize the college here, he was one of those active in that work, and helped to organize the old Chicago Dental Infirmary, and then the Chicago College of Dental Surgery, and was one of its first teachers in the department of operative dentistry. And then he became interested and was active in the organization of another great school in this city, Northwestern University Dental School, of which he, I think, was the first secretary. And he has continued this great work as a teacher and as a leader; and so he has been always active, always busy in these years that he has been in our midst.

Not only has he been active in college work but he has had time to do other things. As you know, he has been a very busy man as the editor of the Transactions of the Illinois State Dental Society, because our society is one of the largest in the country. He was the author of that splendid section in the history of dentistry, the section on operative dentistry. He is the author of one of the best text books we have today on ethics and jurisprudence, and I am sure everyone agrees with me, knowing him as we all do, that there is no one in the world more fitted to write on the question of professional ethics than our dear friend, Dr. Noyes. (Applause.)

In these years, think of the changes he has seen! How this profession has developed in the time that he has been in practice. When he first started, the rule was that the door should be locked, that you would not get from any one else anything that it was possible for him to guard; and today, instead of locking up and keeping to ourselves the best things, the things which would benefit humanity, today we have throughout the land means by which we may give to one another all we have, to have an exchange of ideas, to rub shoulders and to have heart to heart relations, so that we can devise means of perfecting our work, so that we will serve humanity better.

And then when we think of the crude period in which he had to practice dentistry, compared with today. Think of the time he started when he had to use that old fashioned dental engine, as compared with today, when you simply press a button or give a little lever a turn, and you have a working mechanism going at the rate of 2,000 revolutions a minute. And think of that little old cuspidor, that we can see and almost smell even up to this time, then compare that with the whirling ornament which we now have alongside of our chairs. Think of that handy old glass out of which everybody drank, and then think of the sanitary drinking cups which are furnished in most of the offices today.

And so I often think of all these great improvements; and it reminds me of the story of two Irishmen who were talking about the great improvements that were going on. They were sewer diggers and they were taking a little rest, and they lit their pipes and rested on their spades. Pat smoked away and said, "Be gorra, Mike, what do you think of all these new fangled ideas that we have nowadays?" "What do ye mean?" said Mike. "Be gorra, what do ye think of these new fangled sanitary drinking cups?" "Be gorra, I would far sooner drink out of a can any day." "Well, I don't know what we are coming to. If they go on with all this new fangled stuff they will be after making us spit on our hands with an eye-dropper." (Laughter.)

And then think of the compensation that Dr. Noyes got and the compensation that we hear that our friends now get for doing the same things. When he started they cleaned thirty-two teeth for one dollar, and now they manicure and prophylax one tooth for thirty-two dollars. In his early days they pulled a wisdom tooth for twenty-five and fifty cents and today they extract an impacted third molar at one hundred dollars. And in his days they plugged a tooth for fifty cents to a dollar, and today they make restorations, with no limit to the price except the limit of the man's bank account.

He has seen all these changes, not only in the ethics of the profession, but in the earning capacity of the members of our profession, and all the new fangled ideas which have come in, and dentistry has not been free of them any more than any other occupation or profession. We have had fads and fancies and follies, just as many of them as any other profession. But in spite of all this dear little—I was going to say old man, but we never think of saying old Dr. Noyes. We only think of him as Dr. Edmund Noyes. And, Doctor, I want to say I am glad it is that way, because I myself have reached the point where I am a little sensitive, because I have my boy in the office with me, and once in a while they call up over the 'phone and say, "I want the old doctor," and I say, "Put the soft pedal on that. There is a junior and senior here, but there is no old doctor." (Laughter.) And so, in spite of all these follies and enthusiasms and ideas that are going about, this man has kept his feet on the ground and continued to practice the rational and the best dentistry that any man in the country can practice today. (Applause.)

And, Sir, on account of your faithfulness and your service, you should stay with us for quite a little while yet. You are too precious to lose. You are doing too great a work. And our hope and the hope of the Chicago Dental Society and of the dental profession is that you and this dear, sweet, lovely helpmeet of yours will be long spared to associate with us on occasions of this kind, and that you will be spared to enjoy your life and to be an inspiration to the dental profession. (Applause.)

THE TOASTMASTER:

There is more than appears upon the program. I wish to call upon Dr. F. B. Moorehead at this time.

DR. MOOREHEAD:

Mr. Toastmaster, Dr. Noyes, Ladies and Gentlemen: I do not know what impression you got from the reading of the letter written by Dr. Noyes' brother, but the thing that came to my mind was the reference to the "snap gun."

In speaking with President Vincent before we came into the dining room, he was saying something about his father, Bishop Vincent, who is now past 85 years of age. He made this statement: "My father does not live so much in these immediate years, but more in the years that have gone." This does not imply necessarily that one is becoming senile, but it does imply something more than that; that after all, these human things are the things that remain. I imagine that Dr. Noyes this evening has been thinking something about that "snap gun" and those earlier years. After all, what is it that remains? What is the residual quality of life? Certainly it is not dentistry, nor medicine, nor law, nor agriculture, nor art, nor science! The residual quality of life is soul quality. While all of these things combine to make the quality of life better, they are, after all, but means to an end, and do not constitute life's objectives.

Our guest has made a worthy contribution to his profession. He has lived a useful life, a life full of sacrifice for the things he loved.

If you will turn to the title page of Dr. F. B. Noyes' text book on Histology, you will read there these words: "Whatever

I have accomplished in life, or may hope to accomplish I owe to the sacrifice of my father." These words are not quoted verbatim, but contain the substance of the son's tribute to his father. Surely, that is more than dentistry; that is more than histology, more than science. To the father it was no sacrifice, but a labor of love—the thing that cannot be confined to any language limited by the rules of syntax.

Something has been said tonight about the son, F. B. Noyes, and when you think of the father you say, "That is the sort of a son he should have," and when you think of the son, you say, "That is the sort of a father this son should have."

Dr. Noyes, I have been asked to say a word to you on behalf of the Chicago Dental Society, and that word is this: That some day, and may that day be long deferred, when perhaps you will not be in active practice as you are today, and will be looking back upon the past, at that time we want you, if you can, to include us in your thoughts.

There comes a time when one, through the stress and strain of life's circumstances, is forced to think of things fundamental, of things vital, and they are after all things human; when one does not think of medicine, or of dentistry, or of politics, but when the human emotions take possession of one's very soul, and in those hours we would be honored with the thought that we had some part in your evaluation of life's good things.

It is always difficult for one to express his thoughts at a time like this, and express himself without appearing fulsome, but in talking to you, Dr. Noyes, one might stand here and speak for an hour or more and recount the fine things you have done without a single item of exaggeration. These are times when men bare their souls to each other, and let me repeat to you, that we want you to include us in your best thought life.

On behalf of the Chicago Dental Society, I have been asked to give you a small token of our affection, and as you see these things, and as you use them with your loved ones and your friends, we hope they will bring thoughts of joy and pleasure. They are not to be regarded as a wreath of immortelles, but, as Dr. Gallie has suggested, we are trying tonight to break our alabaster box to the living. As you break bread in your own home and use these simple vessels, may you and your good wife remember that they are an expression from this group of men who love you sincerely.

(Dr. Noyes was then presented with a silver service.)

THE TOASTMASTER:

At this time we want to hear from Dr. Brophy.

DR. TRUMAN W. BROPHY:

Mr. President, Ladies and Gentlemen: A great deal has been said this evening about Dr. Noyes, a great deal of information given which the speakers obtained from hearsay. What I am about to tell you is based upon personal experience.

I came to Chicago fifty years ago this month, and began the study of dentistry on the first day of April, 1867. Shortly afterward I noticed a new sign placed up in Washington street near Dearborn, "Dr. E. Noyes, Dentist." I called upon him. I had been in the habit of calling upon all the dentists. There were only about fifty-seven in Chicago then. From the day I called at his office, that acquaintance has become closer and closer.

He was active in the local and state society. He was earnest and enthusiastic in assisting in the organization of the Chicago College of Dental Surgery. In 1882 the work of organizing that college began, thirty-five years ago. He became one of the teaching staff of the school, and remained such until later, when as the city grew and students began to increase, for reasons which he believed were good, he assisted in organizing the dental department of Northwestern University. He has been a member of that teaching staff ever since.

When he left the doors of the Chicago College of Dental Surgery he carried with him the love and the respect and the best wishes of every member of the faculty. That love and respect and the good wishes then shown have lasted up to this time and will continue to last as long as he shall live. (Applause.) In evidence of the esteem in which he is held by the graduates of the Chicago College of Dental Surgery, I have only to point to the words spoken here this evening by three of them—Drs. Gallie, Moorehead and Bentley—which express the sentiments of all of them.

Someone said to me, not long since, "When are you going to stop work?" "Stop work," said I, "what do you mean? I am just beginning." And I think that is the case with Dr. Noyes. Dr. Noyes is just beginning the period of his greatest usefulness.

His life has been a useful life. He has lived the kind of life that every young man should emulate. When I say that his influence has always been for the best, I say what all of you who know him already believe.

I rose more particularly to present to Dr. Noyes a little present which I bring with the love of the old college in which he first labored; and while he meets with his family about the board, he may make use of this now and then. It bears the best wishes and the love of the men with whom he formerly worked and with whom he is still working, in the great cause of dental education.

We are here in Chicago all working harmoniously for the highest and the best aims of our profession. There are no factions in the dental profession in Chicago. There is no discord; there is union in effort and unity of action. Such unity and such effort bring to our city many men from other parts of our country from time to time. Whenever we have a great meeting in Chicago, we find our friends coming from every quarter of this great nation. There are men here today from the Atlantic to the Pacific Coast, and from the extreme north to the southern boundary of our country. The magnet which draws is the good fellowship among us and toward those who honor us by their presence.

Dr. Noyes, as the representative of the Chicago College of Dental Surgery, I wish to present to you this loving cup. It is emblematic of what we hold for you, Sir, and the love which it represents is carried to you by the faculty of the institution which you assisted in organizing. We hope that you will take it and use it and keep it in remembrance of the love that we all bear for you. (Applause.)

(Dr. Brophy thereupon presented to Dr. Noyes a silver loving cup.)

THE TOASTMASTER:

Dr. Arthur D. Black has something to say at this time.

DR. ARTHUR D. BLACK:

Mr. President and Dr. Noyes: There has been assigned to me a very pleasant duty on behalf of this company. But before I perform that duty I ask the privilege of saying a word or two of my personal contact with this man whom we are gathered here tonight to honor.

I think possibly I am the only one in this audience who has eaten two banquets in honor of this man. This first banquet was a good many years ago. Dr. Noyes I think does not even know of it. When I was a kid of about eighteen or nineteen I went with some others on a trip to see our Capitol in Washington, and with the spirit of discovery and adventure we decided to go to Philadelphia, and then to see the battlefield of Gettysburg, and from there we decided to make a trip down the Shenandoah Valley. I met with an accident in which my ankle was sprained, and after being laid up for a day or two I discovered that I had only forty cents more than enough money left to buy a ticket to Chicago, with nothing for a sleeping car berth. So I got on the train and started for Chicago, and traveled in a day coach all the way in. I jumped off for a bite to eat at lunch counters on the way, and finally landed in Chicago broke. I only knew one man in this town, and that was the honored guest of the evening. I went to him and touched him for five dollars. (Laughter.) I had a banquet on him. (Renewed laughter.) That is one element in his character. He was willing to help a fellow who was down and out. And he has helped me many times since in other than financial ways.

If I were to express in one word my view of this man's character and nature, I think I would use the word steadfastness, because I believe if there is any man who has practiced dentistry in this community and who has been steadfast through thick and thin, through one eccentricity and another of the profession, it has been this man. He has been an evener to many of us. And as I have thought in the last few days of some of his counsel, and then have thought of some of the erratic statements that some of us younger fellows have made when we have been a little hotheaded, I have thought that we ought to have taken more and learned more from what this man and other men of his group have shown us by example as well as by word of mouth.

I could not better express the thought that I know is in the minds of all those who are here tonight, Dr. Noyes, and all of whom, as friends, have placed their names within this book, to be handed to you, than to read what is written here from the pen of another man, whom we should all like to have here tonight, Dr. C. N. Johnson. (Applause.)

It is very fitting, in view of the fact that it has turned out that Dr. Johnson could not be with us on this occasion, that he should have had the privilege of writing these words in this book, to which we have all subscribed:

"Dr. Edmund Noyes; modest in demeanor, chaste in thought, noble in character, lovable in disposition, loyal in devotion, temperate in habit, generous in impulse, refined in taste, honorable in dealing, pure in motive, high in ideals, sublime in faith and sturdy in his observance of all things just and right; this epitomizes but meagrely the individuality of Edmund Noyes. It has taken a life time to crystallize his character—it would take longer than one evening to tell of his virtues." (Applause.)

(A book containing the signatures of all present was thereupon presented to him by the speaker.)

THE TOASTMASTER:

At this time we wish to hear from Dr. T. L. Gilmer, who, I think, has something to say on this occasion.

DR. GILMER:

Mr. Toastmaster, Dr. Noyes, Ladies and Gentlemen: In 1872, when I was quite a youth, I came to Chicago to attend a meeting of the Illinois State Dental Society, the first time I had ever attended a dental meeting. It was then that I became acquainted with our honored guest. We both joined the Society at that time. This was just after the great Chicago fire and as a result of the great conflagration, there was no central place to hold the meetings; therefore it was held in the then Congregational Church, now St. Marys, on the corner of Eldredge court and Wabash avenue. Eldredge court is now Ninth street.

I have been closely associated with Dr. Noyes ever since, both having been regular attendants at the meetings of the State Society. We have also, for over a quarter of a century, been co-workers in several of the dental societies of Chicago. We have been associated in school work since 1891. Having had this long and intimate relationship with him, I should have a rather accurate estimate of Dr. Noyes as a man and friend. It gives me great pleasure to refer to him as my friend, since he is a man of such sterling qualities. Anyone who has his friendship is indeed fortunate.

He has always been a living example of the best type of manhood, therefore his example has been for good. I doubt if anyone has exerted a greater influence for high ideals, correct living and ethical standards in the dental profession, than he.

Dr. Noyes is absolutely honest. What better can one say of a fellow-man? (Applause.) I know whereof I speak, since my opportunity to judge has been the best. He is kindly, gentle and lovable. I have never heard him speak ill of anyone. I have occasionally seen him show evidence of displeasure, such as a shrug of the shoulders when palpable wrong was in evidence, and I have heard him speak definitely against what he conceived to be wrong, but even then he was impersonal.

Evidence is fully present here tonight to prove that Dr. Noyes is universally beloved. I have often observed the solicitous inquiry made about him by fellow members of his faculty, when he has been absent from the meetings. He has been so faithful in attendance that should he not be present, it is observed at once by all.

Dr. Noyes, the members of your faculty could not let this occasion pass without showing some material evidence of our esteem for you. I consider it a great honor to act as their spokesman on this occasion, and also in being permitted to present to you this bit of silver, which I assure you but feebly represents our love and esteem for you. We hope that as the years roll by it will be a definite, concrete expression of our esteem and deep regard for you.

(Dr. Gilmer thereupon presented to Dr. Noyes a silver salver.)

THE TOASTMASTER:

It would not be fitting to end at this time without a word from Dr. Noyes himself. I will therefore ask him at this time to respond.

DR. EDMUND NOYES:

My Friends: I have not words with which I may express my thanks, my appreciation, and my happiness. I will not try.

I have always called myself a modest man. Some of my friends I know have called me so. And I submit to you whether you have not put modesty upon a very severe strain tonight. (Applause.)

I shall take refuge in trying to tell you in a very few words the influences and the opportunities that have made me what I am, and without which you would not be saying any of these things about me.

It was in May, 1868, that I made application for membership in the Chicago Dental Society and was elected in the following month. That brought me in immediate association with such men as Dr. Cushing, Dr. M. S. Dean, Dr. Swain, Dr. Koch, Dr. Crouse, and a number of others, men whose surpassing skill, whose sound judgment, whose high professional ideals were the forming influences in my own career.

To these were added afterwards in the State Society a good many others, and I can mention only a few, Dr. Judd, Dr. Fuller, Dr. Eames and Dr. McKellops, of St. Louis; Dr. Ingersoll and Dr. Kulp, of Iowa; Dr. Rohland, of Alton; Dr. Townsend, of Pontiac; Dr. Taylor, of Streator; Dr. Kitchen, of Rockford; Dr. Pritchett, of Whitehall, besides a good many who are still alive, but whom I will not mention. You know them as well as I do.

Later, in 1883, I was a charter member of the Odontological Society, and the ten men in that society were very close. We had monthly meetings, dining together, and always a professional paper and discussion, and the association and friendship and influence of those men was more to me than I can express.

Still later, when Dr. G. V. Black came to Chicago (I knew him, of course, in the State Society before that), the first winter that he gave his entire time to the Chicago College, I was so very fortunate as to have him a member of my family, and the succeeding winter he was a very near neighbor, in the same block. I do not need to tell you how inspiring and valuable the personal contact and friendship with Dr. Black was to me. It was also the beginning of the friendship between him and my son, Dr. Fred B. Noyes. Of priceless value also have been the associations and friendships in the faculties of the Chicago College of Dental Surgery and the Northwestern University Dental School.

These are the men and these are the influences that are largely responsible for the many pleasant things you have been saying to me tonight.

I must refer just lightly to a little mistake that Dr. Gallie made, and which has been made ever since I was a boy, namely, he did not think I am as old as I am, and he marked me down as born in 1845, when, in fact, I was born in 1842. It is the same mistake that happened when I was nineteen years of age, when I applied for a district school and the director looked me over and said, "You are too young." (He thought me fifteen or sixteen.) It is because I am a little man. If I were six feet you would think I am as old as I really am.

There is just one other thing. It was intimated that when we get near the end of life, we live more in the past. My friends, I am still living in the present (applause), and I shall continue to live there for some years to come, I hope. I myself could not have gone back to that snap gun if my brother had not reminded me of it.

I thank you with all my heart, my friends, for your kindness and for your good will. (Applause.)

The Toastmaster:

This closes the program of the evening and terminates this meeting and closes this banquet, which has given, I know, pleasure and satisfaction and joy to everyone here.

(The meeting then adjourned.)

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

HAS THE DENTAL PROFESSION TAKEN LEAVE OF ITS SENSES?

The foregoing query is naturally suggested by some of the statements appearing from time to time in our dental magazines. If we followed the advice of all of the writers of the day we would scarce practice dentistry at all, but would meekly stand when a patient applies for relief, and in a "holier-than-thou" attitude declare solemnly that it was no longer authorized procedure to do many of the things by which the profession had been serving the people for years.

We would lay aside our gold pluggers; we would banish bridge work, particularly fixed bridges; wewould never—no never—use arsenic for destroying pulps; we would even look askance at pressure anesthesia for this purpose; we would never fill pulp canals without checking up our work every few minutes with the X-ray; we would never consider a pulpless tooth safe from focal infection in which the X-ray failed to show the filling beyond the end of the root; we would never leave a tooth in the mouth if the X-ray showed the slightest trace of rarefaction at the root end; we would never attempt to preserve a tooth if it had once been abscessed, etc., etc. With what result? Simply forceps and artificial dentures—and subsequent profanity from our patients.

Most of these writers are perfectly conscientious, and what is more, most of them have seen the light. The trouble is that they have concentrated their vision on only a few rays instead of taking in the whole glorious horizon. Too often in this as in every profession men become permeated with an idea and shut their eyes to every fact which does not fit into that idea.

Let us briefly examine some of the recent pronouncements. It goes without saying that the introduction of the gold inlay was a blessing to the profession and to humanity, but the man who practices without using his gold pluggers is not in every case doing the best service for his patients. Bridgework and all the principles which should govern its use have been outrageously abused, and much harm has been done thereby; but this does not alter the fact that bridges—fixed bridges—from a few teeth to many, have in numberless cases done excellent service and given much satisfaction to patients, adding comfort and years to their lives. Fixed bridges have been known to last more than twenty years, remaining firm and satisfactory for that time, and if the principle of the fixed bridge were wholly wrong there would never have been so many of these successful cases. This does not mean that a better plan should not be welcomed if it presents itself, but too frequently in the past these "better plans" have not turned out to be better. Nor does it mean that we should not put more discriminating thought and better judgment into all of our bridgework, and profit by the mistakes of the past. If we do this bridgework will still remain a blessing.

Arsenic is a dangerous drug. Everyone admits that, or should admit it. Considering the manner in which it has been used in the past the marvel is that it had done as little harm as it has. It has been "slopped about promiscuous" by all sorts of slip-shod methods, and has naturally left some sad tales in its wake. But used judiciously it has a definite and legitimate place in pulp destruction, else its general employment for the past half a century would have long since relegated it to oblivion. Men do not go on blundering in a practice like that for more than fifty years. When something better and safer for destroying the pulp is introduced the profession will be glad to welcome it. The introduction of pressure anesthesia promised at first to solve the problem, but it turned out a failure in some cases, and in many hands; and now there is a cry against it for various reasons—the danger of forcing infection into the apical region, the resultant soreness in some instances, its unreliability in others, and the difficulty experienced at times in confining the drug and forcing it into the pulp. And yet the fact is that for certain cases pressure anesthesia is ideal—the moral of which is that we need different methods to meet different cases.

Those who are today condemning arsenic and pressure anesthesia in a sweeping way and advocating conductive and interosseous anesthesia for the removal of pulps are promulgating a doctrine which will never stand the test of time or experience. It is a most grotesque and unreasonable way of removing a pulp, to say nothing of the untoward results which are likely to follow in its wake. We need progress and the introduction of new ideas, but we should have a care that the enthusiasm of the new does not lead us into the promulgation of a foolish and dangerous practice.

The X-ray is a most useful agent in pulp canal and other work, but to say that no pulp canal should be filled without checking up with X-ray pictures at frequent intervals is sheer folly. In a paper read before the Chicago Dental Society and published in the April number of the DENTAL REVIEW Dr. Edmund Noyes made in a few words the sanest statement about pulp canal work that we have recently seen—stripping it of much of the intricacy and mystery which has been thrown around it. It will pay the profession to read that article.

The limits of editorial space will not permit a further consideration of the extremes which men are teaching today, but the advice is hereby given to those in the profession who have been driven into doubt and even into despair by the extravagant statements that are being widely made, that they shall preserve their balance, do the very best they can for their patients always and forever, and refuse to be stampeded out of a legitimate line of practice which their own experience has taught them to be safe and sane.

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. V.

My Dear Boy:

One of the worst enemies in a minor way you are likely to have in your youth is impetuosity. It will get you into continual trouble if you do not control it. In all the realm of human emotions there is no other that needs curbing so much as this. It leads to anger, hatred and contention. Youth is full of it. Every one of us has suffered from it, and it has landed every one of us into trouble. I have often wondered why we cannot learn this lesson early in life—the lesson of toleration, of deliberation, and self-control. But apparently we cannot. We fly off the handle at each interference with our plans—even our whims. We assume that our point of view is the only correct one, and we will not wait to see. Invariably we place ourselves at a disadvantage when we give way to impetuosity—invariably we lose out.

I often think that this must be a heritage from our anthropoid ancestors, and we have to live almost a lifetime to overcome it. I trust that you may learn this lesson early in life; at least if you do not I shall not have you on my conscience, because I am warning you now.

Let me give you a concrete example. In dealing with patients you will encounter all kinds of annoyances, all sorts of unreasonableness. Humanity seems to be built that way, and the man who wins out is the one who accepts this fact philosophically and goes serenely along without permitting himself to be annoyed by every pecadillo of those with whom he comes in contact. Do not fly in a rage and commit rash acts when patients seem unreasonable. Impetuosity breeds contempt, and you lower yourself every time you give way to it. If you are about to lose your temper and say harsh things, bite your tongue and keep quiet. You had better make a sore place on your tongue than to employ it with impetuous language. Remember that the affairs of life were not all regulated for your particular pleasure or from your point of view, and the person with whom you are growing impatient may have as good a basis for the position he takes as you have for yours. The most difficult thing for all of us to see is the other person's point of view, but if we should discipline ourselves to do this it would save us much needless friction, and would conduce greatly to our peace of mind.

If contention is forced on you remember that it is always a real advantage over your opponent for you to keep calm and collected. This will be difficult for you to do while you are young and impulsive, but learn the lesson, and it will prove your safest sheet anchor against discomfiture and defeat.

If things do not move precisely your way you should recognize the fact that you were not destined to reform the world, at least you were not expected to do it all at once. Preserve your soul in patience and the things really worth while will come to you in time.

I expect that you imagine I am outlining a very dull sort of life for you to lead. Not in the least. In my heart I want you to have lots of fun, and I believe I am indicating how you may have it. The best fun ever experienced is to gain control over your own impulses so that they will obey your will. That is real fun—the fun that is ever fresh, that never palls, nor grows stale. It lends a zest to life that nothing else will, and the only reason most of us are not happier is because we have not learned how to do it. This is not mere negative or evanescent fun which simply diverts and lasts only for the hour. It is positive fun which grows keener and keener as we play at it. It is constructive and cumulative—satisfying and sure. I want you to have all of this kind of fun you can, and if after you have played at it for a time you do not find it the best fun you ever had then I shall be willing to acknowledge that all of the philosophy I have learned through life is false.

In connection with the control of impetuosity is the cultivation of tact. Tact is the lubricant which makes the machinery of professional practice run smoothly. Without it you are likely to encounter hot boxes, and burned bearings; but with it you can take the grades easily and move over the hills without hitch. Tact is the soothing syrup of life, and a sedative for tired nerves. It has the sweet savor of harmony, and the incense of perpetual peace.

To cultivate tact it is necessary to study human nature, that you may know by intuition every mood and whim, every fancy and folly of your patients. Till you understand humanity with all of its varying tendencies you are in no position to tactfully conduct a practice, and unless you can do this you will always work at a disadvantage. Therefore, it is essential that you develop tact at the beginning of your career.

Fortunately for you the very best place in which to study humanity is in a dental office, and if you fail to become familiar with human nature it is your own fault.

Aside from the advantage it gives you in practice the study of human nature is well worth while. Stripped of its artificial veneer the motives and tendencies of humanity are intensely interesting, and most instructive. Nowhere in any book can so much knowledge of life be obtained as by studying the real thing at first hand, and I commend you most urgently to take advantage of your superior opportunities in this regard, and become a close student of the people with whom you come in contact. Do this not from any idle curiosity, but that you may know more of the limitless science of human life.

Sincerely your friend,
C. N. J.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

Inserting Silicate Cements:—It is by no means necessary to always use the rubber dam in inserting the silicates. What *is* necessary is absolute dryness for several minutes. Secure this in any way you choose and the results will be good.—*Arthur G. Smith, Peoria, Ill.*

Protecting the Eyes While Casting:—To watch the glare of a molten mass of gold without protecting the eye is injurious. A perfect vision of the gold may be had without subjecting the eye to strain by closing the fingers of the hand into the palm in the form of a funnel, and peeping with one eye through this funnel, while closing the other eye. This excludes all glare and enables the operator to see most perfectly the condition of the molten gold.—*Editor.*

Removing Broken Roots:—Frequently the roots of upper bicuspids and molars are broken off, so that it is difficult to extract them with forceps. By using a small rose-head bur 00 in the handpiece and drilling as far as possible into the root we can generally remove it by taking hold of the bur with forceps. If this fails try No. 5 S. S. W. tap which is used for anchorage of posts in enamel work, and screw the tap into canal or in the opening where the bur has pulled out and see how easily these small roots can be removed.—*L. R. Brown, Clearfield, Pa.*

To Flow Casting Wax to the Bottom of Deep Pits:—It is sometimes difficult to force wax perfectly into pits or sharp depressions. A simple way of doing this is to plunge a heated instrument like a canal plugger through the wax to the bottom of the pit. This carries the wax with it. As the instrument is withdrawn, if it leaves a hole press a small piece of the casting wax into it with the finger or a flat burnisher. In this way a deep depression may be perfectly filled with wax. Even in a tooth with the pulp alive there is little discomfort as the heat is quickly dissipated.—*W. F. Lawrens, Carpinteria, California.*

Root Canals:—The chip blower heated over the alcohol lamp generates formaldehyde gas as the air is drawn in; this expelled into the roots of teeth is why drying the root canals has been so effective. Please bear in mind that the electric hot air is not as efficacious, as it is simply hot air that comes from an electric syringe. You can easily prove it for yourself by the acid sulphuric and resorcin test. The slightest trace of formalin will turn it purple. This a chip blower will do, an electric will not. Stick to your chip blower—and use a fresh one now and then, and be careful of water condensing in same. Formaldehyde gas is a wonderful antiseptic.—*Homer Almon.*

Matrices:—We think we do some wonderful things, but how surprised we are when some one "steals (?) our thunder." I have been using sheet steel for matrices for years, trimming it and bending it to suit the case. Cutting notches in the sides which would allow of bending the top back over the adjoining tooth to the one to be filled, and then bending the sides around the tooth containing the cavity.

Well, Pinches have put a matrix on the market and they save a lot of time. I punch holes in the sides when I can not make a wedge suffice, and ligate the gingival portion tightly to the neck of the tooth.—*Homer Almon.*

A Perfectly Clean Cement Slab:—This is always assured if the slab, or preferably Ames water bottle slab, is immersed after a mix of silicious, oxyphosphate or copper cement in a vessel (a 10-cent glass jar such as is used with LeClanche or similar battery answers admirably) containing commercial muriatic acid 1 part approximately to 10 of water. The slab or mixing bottle is left in the acid solution until next needed when it is removed, rinsed rather carefully under faucet, dried and found perfectly clean ready for use. Any suitably shaped bottle with Ames thermometer in cork for insertion in the bottle enables one to secure mixing surface when bottle is filled with water of right temperature that is uniform and although most needed in summer will be found ideal for use throughout the year.—*J. F. F. Waltz, Decatur, Ill.*

A Hint About Dental Bridges:—If a dental bridge is attached to a solid fixed anchorage at one end and a loosened tooth or root for anchorage at the other end it will be a short-lived bridge. Such a bridge being movable at one end makes a lever of the bridge and the force of mastication being the power applied will tear the solid fixed end loose from its anchorage, or loosen the root, or break the bridge. A firm fixed anchorage at one end of a bridge will not sustain and hold firm the opposite end if the anchorage of said opposite end is loosened in the outset or becomes loosened after the bridge has been in use. If the anchorage for one end of a bridge is not firm the anchorage for the opposite end should be correspondingly movable. If the anchorage for either end of a bridge is not firmly fixed it would be better to choose some other method for restoring or supplying the lost teeth.—*H. A. Cross, Chicago.*

To Make a Die for Swaging a Metal Plate:—Take the impression with a mixture of good plaster and pulverized pumice. Take two parts plaster to one of pumice. Use an impression tray large enough so you can easily remove the tray without breaking the impression. Repair any air bubbles or imperfect places with plaster. A very thin coat of wax on the tray will facilitate its removal after warming sufficiently. Drill four small holes through the impression about half an inch apart near the center. Thoroughly dry the impression over a gas heater taking care not to heat too rapidly, causing it to crack. When all moisture is removed which will take several hours, fill your flask with the ordinary moulding sand, imbed the impression in it and fill the outer part even with the plaster rim of the impression. Put on the top rim of casting flask and pour your melted zinc directly into the plaster impression. You will thus secure a metal die on which you can swage a metal plate that will fit, no difference how much undercut there may be. To secure a satisfactory die, the plaster impression must be dry.—*Geo. D. Sitherwood, Bloomington, Ill.*

CORRESPONDENCE.

LETTER FROM DR. M. D. K. BREMNER.

Chicago, April, 1917.

My Dear Mr. Editor:

With your permission I would like to make a few comments on Dr. Noyes's opinions about some of the things he heard at Milwaukee.

Dr. Noyes says "there is nothing more fundamental in human life than morality, that economics which does not find its foundation etc., etc., on morality is not sound economics." It strikes me the doctor is over stating this morality idea. Since when has morality become fundamental? Is there such a thing as a standard morality? Is it alike in all ages and in all generations? Do all people in all countries subscribe to the same system? Which brand of morality has Dr. Noyes in mind? Is that of the 400 million Christians, most of whom are butchering each other just now, or of the 600 million Buddhists? The next statement that economics is unsound unless founded on morality is a new one altogether. Let us see how it squares with some of the facts in our possession. Cannibalism was practiced for thousands of years. As long as the savage lived on the uncertain existence of the chase with the food supply owing to the crude weapons at his command both scanty and irregular it was good economics to eat the captive, for not only did it spare the necessity of feeding another mouth but it also added perhaps a palatable variety to a none too generous bill of fare, yet it can hardly be said to have been good morality.

Later when we passed from the savage stage into barbarism and learned to domesticate the animals and till the soil, so that a man was able by the labors of his hands to produce more food than was required to keep him alive, the captive was put to work, cannibalism was discontinued and slavery took its place, and this in turn was good economics, some of the greatest achievements of mankind were produced under slavery. Egypt, Greece, Rome, all were slave states; however, today no one will admit slavery to be moral.

The fact is economics is not based on morality but on "The will to live," and anything which furthers this primodial instinct, this inherent urge in all life, becomes sound economics and even good morals. But while Dr. Noyes is wrong in his idea on morality he is nevertheless right in his opinion on ethics. There is such a thing as professional ethics, and the reason some of our dental economists do not see it, is, because they have the general, the superficial conception of ethics. As a matter of fact, ethics is not singular but plural. There are a great many varieties and of different degrees, each kind based in a general way on the amount of trust and confidence necessary between the different parties in that particular line of human endeavor to conduct it successfully. In short I would call it pragmatic ethics. The banker has a higher standard than the average business man. He has to have it. The same is true of the wholesaler and manufacturer as compared with the ordinary small storekeeper. These things are so because society must have them so. The higher standard of honor in the business world today is due to the great variety of things now consumed by the people. It would be impossible under the present conditions to get along on the "Cavite emptor" let the buyer beware principle, since no one person is able to know the contents, quality and value of all the goods he uses, and so arises the necessity of accepting things on honor. This automatically improves the standard of honor.

Therefore, when we come to the professions, say to dentistry, our relation to the public, the trust and confidence which they *must* place in us pre-supposes a very high degree of honor and ethics in our dealing with them; the standard of the plumber or the merchant will not do for us, because the conditions are different.

It is true that very often this works to our financial detriment, but there is no remedy for it just at present. Our calling is to battle with the cruelties of nature, to ease pain or relieve suffering. We deal not with accessories of life but with life itself, and very often full reward we must find in the work itself. However, if this is not enough for some men, then let them go into other walks of life where the standard is lower, but not try to pull the profession down to suit their purpose. To paraphrase a famous saying, "What good will it do to gain an income and thereby lose our soul?"

M. D. K. BREMNER.

LETTER FROM DR. C. EDMUND KELLS.

New Orleans, April 11, 1917.

Dr. C. N. Johnson,
Marshall Field Building,
Chicago, Ill.

My Dear Doctor Johnson:

It has frequently occurred to me that contributions to the Dental Journals should be censored, and had such a practice been in vogue by the Editor of the DENTAL REVIEW, I am confident that the article by Dr. W. J. Holroyd in the April number would not have been allowed to appear in your Journal.

I agree with the writer that it is a mistake that dental colleges do not give a course upon the business side of dentistry, but they had much better continue as now in not giving any, rather than teach the boys "salesmanship," (how that word does grate upon my ears when applied to professional services!) and a lot of other erroneous ideas as suggested in the article in question.

Your very cordially,
C. EDMUND KELLS.

LETTER FROM DR. L. E. CUSTER.

Dayton, Ohio, April 2, 1917.

Dr. C. N. Johnson,
Chicago, Ill.

Dear Dr. Johnson:

Your editorials are to the point. I was present at the St. Louis meeting last November when you read your paper on "Some of the Present Tendencies in Operative Dentistry." As the discussion was only open to direct questions I did not venture in, but I would have been pleased to rivet home your position on the general extraction of those teeth which when rayed show light areas about their root apices. These are not all abscesses—not by a long shot. I happened to be the second dentist to take up the X-ray in dentistry, Dr. E. C. Kells being the first; and after a period of twenty-two years in X-ray work and study of the behavior of teeth showing light areas about the root apices I am prepared to show that ninety per cent, and perhaps more, of all pulpless teeth show rarefaction about their root apices.

Why is this, and what does it mean? My answer is that nature never intended that a tooth should be pulpless, and no matter how well a pulp canal may be prepared and filled it still is not a normal pulp canal. The apical foramen and region thereabout is the vital point in the whole proposition and unfortunately the apex is the most difficult to seal in a manner comfortable and non-irritating to nature. The unfilled apex or an apex sealed with a foreign material is an irritant, although it may be slight, to the surrounding tissues. The result is the resorbtion of the bone in the immediate vicinity and its replacement with a new tissue which when completed encysts the end of the root. Now the encysting tissue being devoid of lime salts shows dark in the skiagraph and unless one has had considerable experience in the observation of these cases, he will make the common mistake of pronouncing such skiagraph as showing an abscess.

It is a fine how-de-do when a physician at this day, without any dental experience in these things, shall dictate to a dentist, authorizing the extraction of such teeth. That there are abscesses about the roots of pulpless teeth we are not denying, but anyone with X-ray experience can tell the difference between an encysted root and an abscess. The correct interpretation of a skiagraph in dental cases can not be made by a physician unless he has had a long clinical observation in dental practice and it is not his place to authorize extraction by a mere glance at a skiagraph.

Very truly,

L. E. CUSTER.

MEMORANDA.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The Illinois State Board of Dental Examiners will hold their next examination at the Northwestern University Dental School, Chicago, commencing June 15th, at 9 A. M. For further information address Dr. O. H. Seifert, Secretary, Springfield, Ill.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL ALUMNI ASSOCIATION.

Annual Home-coming Clinic, 31 W. Lake St., Chicago, June 11th and 12th. Good program for each day. All alumni urged to attend this, the best meeting in the history of the organization. M. M. Printz, Secretary, Alumni Association, 4235 Lake Park Ave., Chicago.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

At the last annual meeting of the American Institute of Dental Teachers, held at Philadelphia, Pa., January 23 to 25, 1917, the following officers were elected: President, Dr. John F. Biddle, 517 Arch street, Pittsburgh, Pa.; Vice-President, Dr. A. W. Thornton, McGill University, Montreal, Que.; Secretary-Treasurer, Dr. Abram Hoffman, 529 Franklin Street, Buffalo, N. Y.; Executive Board, Dr. R. W. Bunting, Ann Arbor, Mich., Dr. A. D. Black, Chicago, Ill., and Dr. G. S. Millberry, San Francisco, Cal. The next annual meeting will be held January 29, 30 and 31, 1918. The place of meeting will be announced later.

NOTICE.

The California State Dental Association will hold its regular annual session for the year 1917 in San Francisco, June 6, 7, 8 and 9. A cordial invitation is extended to members of other associations. For further information and particulars regarding exhibit space, communicate with the secretary, John E. Gurley, 350 Post Street, San Francisco.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board of Dental Examiners for the examination of candidates will be held at Iowa City, Iowa, commencing Monday, June 4th, 1917, at 9 A. M. For further information and application blanks write the secretary, Dr. J. A. West, 417 Utica Building, Des Moines, Ia.

NORTH DAKOTA STATE DENTAL ASSOCIATION.

The North Dakota State Dental Association meets in Fargo, May 15 and 16, 1917. Good clinics and exhibits by manufacturers. All members of the National Dental Association or any state society are cordially invited to attend. Solon Crum, secretary.

MISSISSIPPI STATE BOARD OF DENTAL EXAMINERS.

This Board will meet in the capital of the state on the third Tuesday of June, 1917, for the purpose of examining candidates for license to practice dentistry. For further information address Dr. H. J. Arledge, secretary, Poplarville, Miss.

BOARD OF DENTAL EXAMINERS, STATE OF WYOMING.

The Wyoming Board of Dental Examiners will meet in Cheyenne on June 26 to 28, 1917, and all applicants holding reputable diplomas are eligible to examinations. The examination fee is $25 and must accompany application and be in the hands of the secretary 15 days prior to the time set by the Board. For further information and for blanks, address Peter Appel, Jr., secretary, P. O. Box 643, Cheyenne, Wyoming.

THE WYOMING STATE DENTAL ASSOCIATION.

The Wyoming State Dental Society will meet in Cheyenne, June 18 and 19, 1917, in its second annual meeting. All members holding national cards are cordially invited. Peter Appel, Jr., secretary, Cheyenne.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The Wisconsin State Board of Dental Examiners will meet to give examinations, June 20, 1917, at Berlin Arcade Hall (fourth floor), corner Third and North, Milwaukee, Wisconsin. Applications with fees and necessary preliminary credentials must be sent in to the secretary twenty days before examination. F. A. Tate, D. D. S., secretary, Rice Lake, Wis.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, S. D., July 9, 1917, at 9 A. M. sharp, continuing four days. All applications must be in the hands of the secretary by July 1. Fee, $25. Address Robert Jasmann, secretary, Scotland, S. D.

AMERICAN MEDICAL ASSOCIATION CLINICAL CONGRESS, JUNE 4, 5.

The American Medical Association will hold its annual meeting in New York City, June 4 to 8. In all probability this is to be the greatest meeting of medical men ever held in this country. The committee on arrangements consists of Drs. Wendell C. Phillips, Floyd M. Crandall and Alexander Lambert. Headquarters have been established at 17 West Forty-third street, New York City, to which all communications should be addressed. Monday and Tuesday, June 4 and 5, will be devoted to a Clinical Congress, in which all departments of medicine will be represented, each department to have its own series of clinics, occurring in different parts of the city.

The following is a list of chairmen of departmental committees: General Medicine, Samuel W. Lambert; Pharmacology and Therapeutics, Frank S. Meara; Pathology and Physiology (A) Clinical and Medico-Legal, Otto H. Schultz; (B) Laboratory (Diagnostic) Frederic E. Sondern; (C) Cancer Research, Francis C. Wood; Preventive Medicine and Public Health, H. M. Biggs; (A) State, Linsly R. Williams; (B) Municipal, Haven Emerson; Pediatrics, Rowland G. Freeman; Dermatology, Howard Fox; Neurology, Edward D. Fisher; Mental Diseases, Carlos McDonald; General Surgery, Charles N. Dowd; Orthopedic Surgery, Virgil P. Gibney; Gynecology, George G. Ward, Jr.; Obstetrics, Edwin B. Cragin; Urology, Edward L. Keyes, Jr.; Rectum and Colon, Jerome M. Lynch; Ophthalmology, John E. Weeks; Otology, Edward B. Dench; Rhinology and Laryngology, Lewis A. Coffin; Stomatology, W. B. Dunning; Roentgenology, Lewis G. Cole; Anesthetics, James T. Gwathmey; Women Physicians, Mathilda K. Wallin; Brooklyn Representatives: John C. MacEvitt, William F. Campbell, Joshua M. Van Cott, Paul M. Pilcher, Albert M. Judd; Allied Topics: Trained Nursing and Training Schools, Miss Adelaide Nutting; District Nursing System, Miss Lillian D. Wald; Hospital Social Service, Mr. James K. Paulding; Planning and Financing of Municipal and Non-Municipal Hospitals, Sigismund S. Goldwater; Hospital Superintendents and Executives, Robert J. Wilson; Military Surgery and Red Cross, Samuel Lloyd.

The great number of clinics, their scope and scientific value, will be unprecedented. The program is in active preparation, soon to appear in full in the *Journal of the A. M. A.*

Between seven and ten thousand physicians are expected to attend this Congress, and it is hoped that dental practitioners throughout the country will avail themselves of this opportunity to become Associate Fellows of the Section on Stomatology and thus be entitled to attend these clinics as well as the regular meeting of the Association on June 6-8. The following is quoted from a letter from the general secretary:

"Dentists holding the degree of D. D. S. who are members of state or local dental societies and who are not eligible to regular membership, may be elected to Associate Fellowship by the House of Delegates of the American Medical Association when a formal application for such Associate Fellowship has been approved by the Section on Stomatology. In other words, when a dentist holding the required degree makes formal application for Associate Fellowship, accompanying this application with a certificate from the secretary of his state or local dental society, which certificate certifies to his being a member in good standing in that body, this application and the attached certificate is forwarded to the secretary of the Section on Stomatology for the approval of that section. The application is then in form for presentation to the House of Delegates for the election or rejection of the applicant. . . .

"We will be glad to transmit any such applications, or they may be sent direct to the secretary of the Section on Stomatology, Dr. Eugene S. Talbot, 31 North State St., Chicago."

Headquarters of the Section on Stomatology will be at the Hotel Astor, Broadway and Forty-fifth street.

No more impressive opportunity for the fraternization of dental and medical men has ever been presented in the history of the profession. Every dentist who reads this announcement should enroll immediately in the Section on Stomatology (annual dues $5, which entitles him to the weekly *Journal of the A. M. A.*), and thus place himself in direct touch with the greatest happenings in medical science.

HENRY W. GILLETT,
ARTHUR L. SWIFT,
WILLIAM D. TRACY,
HENRY S. DUNNING,
ARTHUR H. MERRITT,
WILLIAM B. DUNNING, *Chairman.*
Clinical Com., Sec. on Stomatology, 140 West 57th St., N. Y. City.

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THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, JUNE, 1917 No. 6

THE CONSERVATION OF NATURAL RESOURCES.*

BY PROF. H. H. BARROWS, OF THE UNIVERSITY OF CHICAGO.

During the last few years there has been much discussion of the waste of our natural resources, and of the need of conserving them. Conservation has come to be not only a much used term, but a much abused one. As applied to natural resources—lands, forests, minerals, and waters—it means, in the strict sense, efficient use, without waste. It follows that it does *not* mean, as many appear to suppose, the withdrawal of resources from use by the present generation, for the benefit of generations to come. If the real interests of the present and the future conflict, present interests should be held supreme and the future be left to solve its own problems. In other words, the people of today have a right to use such of the resources of the earth as they need, as rapidly as may be necessary to realize their highest interests, even though in some cases such use may involve early exhaustion. But this right carries with it the heavy obligation of using these things efficiently and economically, so that the supply of non-renewable resources shall remain as large as is practicable for those who are to follow. Nor does conservation require the utilization of all the natural products handled by man; this would be highly uneconomical, and in many cases impossible. Thus the lumberman cannot profitably remove from the forest all the wood of the trees which he cuts, the lumber manufacturer cannot sell all the material that comes to his mill, and at every stage in the manufacture of commodities using wood as raw material, there is unavoidable loss in the form of sawdust, trimmings, blocks, etc. Materials unused because it is impossible profitably to use them are lost, but not wasted; unused materials which could be utilized with profit are wasted. Conservationists properly may condemn waste, as just defined; it is futile for them to demand complete utilization in the processes of adapting the products of nature to human needs.

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* Read before the Odontological Society of Chicago, March 7, 1917.

While, in the narrow sense, conservation means merely wise, effective use, without waste, the content of the term has been enlarged by many to include also the questions of the control and ownership of resources, and the distribution of benefits arising from their utilization. Some considerable extension of the original idea in these directions was inevitable, especially in the case of the resources of the public domain; consideration of the technical aspects of the subject was certain to develop inseparable problems in administrative, legislative, and other fields. The development of effective methods of reclaiming arid and swamp lands, of reducing soil erosion and maintaining soil fertility, of caring for forests, of eliminating waste in mining, of using to better advantage mineral fuels and metals, of controlling and utilizing waters, and the like, are strictly technical or engineering problems. But in many cases administrative or legislative measures are necessary to make possible the use or to enforce the use of the methods which the technical student has found most suitable. Unfortunately, however, attempts have been made to incorporate all sorts of social, economic, and governmental propositions in the conservation movement, until in the minds of many the latter has come to include almost every conceivable good. As a result, the progress of real conservation has been retarded, and many men have withheld or withdrawn their support from the movement, who otherwise would have aided it.

The extraordinary progress of the American nation along economic lines, and the present material well-being of its people, are due largely to the abundance and variety of the natural resources in its possession. No other country has been endowed so richly by nature. The supply of almost every earth-resource needed in modern production has seemed inexhaustible; there apparently was no need of conservation. "Bred to carelessness in the midst of unparalleled plenty", the nation exploited its resources recklessly and extravagantly, wasting of many things as much as it used. Scientists occasionally raised warning voices, but the public at large paid little heed. There was little or no thought of future generations, for it seemed impossible that there ever could be less than enough for all. Extravagance and waste became national characteristics.

The recent conservation movement has rendered the country a very great service by bringing about a widespread realization of the fact that our natural resources, though in most cases far from exhausted, have been and are being consumed at an alarming rate, and that enormous quantities of these resources absolutely are wasted. The annual loss to the country from the washing and leaching of soils, most of which could be avoided, is estimated at some $500,000,000. Although the land even of eastern United States has been cultivated by a short time compared with that of much of Europe, we have allowed at least four million acres of farm land to be ruined by soil erosion. It has been estimated that the area thus ruined would, if covered by fertile soil, be capable of supporting a population greater than that of any one of the twelve least populous states. Doubtless the total loss to the country from the partial destruction of soil is even greater. Nor is this all. The soil carried away may do much harm where it is deposited. Streams which carry much sediment deposit some of it in their channels, thus impeding navigation. The clogging of river channels also helps to cause floods, the average annual loss from which exceeds $100,000,000. Reservoirs, such as mill-ponds, may be filled with sediment, interfering with manufacturing. Streams are polluted, interfering seriously with their use as a source of water supply for cities. Exploitive methods of farming have lessened the productivity of the soil over large areas. Insect pests inflict damages involving an estimated annual loss of at least $1,000,000,000 on farm products. This enormous figure is about one-ninth of the total annual value of American farm products in recent years. Perhaps half the serious pests, including the Hessian fly, the codling moth, and the San Jose scale, have been imported, the United States till 1912 being a dumping-ground for insect-infested plant stock because it had no plant inspection and quarantine law. Repeated efforts to secure such legislation by the National Congress failed largely because of the opposition of a few importing nurserymen. Yet the entire annual value of the imported nursery stock was only about $350,000.

Although recent improvements have been made in mining coal, it still is true that, taking the industry as a whole, we lose and waste about half as much as we produce. We produced in 1916 about 1/20th of the total amount of coal mined in the United States since 1807, and we lost and wasted in so doing as much as was produced in 1913 by Great Britain, the second coal-producing country. The significance of these facts is more apparent when it is added that if we should continue to draw on our coal at the rapidly increasing rate of recent decades, the entire supply would be exhausted before the end of the next century. Nearly two-thirds of the coke made in the United States in 1916 was produced in beehive ovens, in spite of the fact that better coke and more coke per ton of coal used is produced in the modern retort oven, which also saves the valuable by-products—tar, gas, and ammonia—wasted in the beehive oven. In a recent year the soft coal used in making coke contained $22,000,000 worth of recoverable nitrogen, but only $3,800,000 worth was saved. A few years ago an expert of the United States Bureau of Mines wrote: "Probably in no other industry, unless in the mining of coal itself, is there so much waste as in the manufacture of furnace and foundry coke. Particularly unfortunate is the fact that this waste is in most instances deliberate, the more economical methods being well known to those most interested. One cause for this condition is the conservatism of the trade, old methods being followed blindly, regardless of improvement elsewhere." In the ordinary steam-power plant and in lighting plants it is possible as yet to utilize only a small fraction of the theoretical energy of the coal.

In 1916 we produced nearly one-thirteenth of all the petroleum that has been produced in the United States, and should our consumption increase as in the past, the supply in known pools will be exhausted in twenty-five or thirty years. Yet we use one-third of the oil produced as fuel, when in most cases less valuable substitutes would suffice.* For example, in 1916 more than 31,900 miles of railroad in the United States were operated wholly or in part by the use of fuel oil, more than 42,126,000 barrels of the latter being consumed. In California the loss by evaporation of oil is estimated as 25 per cent. The erroneous notion which seems to prevail in many quarters concerning the future of this resource is illustrated typically by a statement which appeared in *Power* and in the *Outlook Magazine*. Commenting on the rapidly increasing use of oil fuel by railroads, it said, "Some of the railroads in the northwestern part of the United

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*The substitution of oil for coal as fuel for the navy was justified as a measure of national safety, since the oil-burning ships attain greater speed and have greater radius of action.

States and in southern Canada held to coal for a considerable period after the permanency (!) of the fuel oil supply was assured."

Of natural gas, the best of fuels, we were estimated some years ago to be wasting 1,000,000,000 cubic feet daily. The amount going to waste at one time has been sufficient to light all the cities of the United States having a population of more than 100,000. The West Virginia Conservation Commission said in 1908 of the waste of gas in that state: "The total waste in West Virginia probably has exceeded the State's entire coal production—about 500 million tons—counting that it takes 30,000 feet of gas to equal one ton of coal. This is 15,000,000,000,000 cubic feet—a row of figures which cannot possibly convey to the mind an adequate idea of the vast quantity indicated. Picture it another way. Imagine freight cars each loaded with 45 tons of coal following one another down an incline, one minute apart, and pouring their coal into an abyss from which it could never be recovered. * * * The waste of gas has equaled what that waste of coal would be, not for one day alone, at a car a minute, not for one week only, or a month, for not until the incessant procession of 45-ton cars had plunged into the abyss minute by minute, day and night, for twenty years would the loss come up to that of natural gas in West Virginia through the negligence of man." Said a speaker at the last meeting of the American Mining Congress: "I have seen millions of cubic feet of natural gas wasting in the air—gas so rich in gasoline that it dripped from the trees like an April shower." Within twenty-five years, at the present rate of use and waste, all the known supplies of natural gas probably will be exhausted.

In connection with the loss and criminal waste of mineral fuels it should be remembered that ages were needed for their production, and that man cannot duplicate them. When the existing supplies are used or wasted, these resources will have come to an end.

In some of the metal industries the average wastes and losses have been heavy. In the case of lead and zinc only about half the metal that was in the ore in the ground has been recovered.

The merchantable timber once in our forests is half gone, and we are using wood three and a half times as fast as it is being produced by the growth of our forests. Each year preventable forest fires have burned over 5,000,000 to 10,000,000 acres of forest land, consuming, in the aggregate, nearly as much timber as was cut, and inflicting indirect damages which it is impossible even roughly to estimate. In a recent six-year period, nearly 17,000 recorded fires occurred in the National forests of the West, at least 75 per cent of which were preventable. In Michigan alone, forest fires caused a loss in merchantable timber of $20,000,000 between 1901 and 1911. On the average only some 320 feet of timber are used for each 1,000 feet standing in the forest trees and cut for use. Probably not one-fiftieth of the lumber on the market was cut in accordance with the principles of scientific lumbering, and with a view to the continued production of timber on the land whence it came. Of course part of this land is suited to farming, and will be so used, but much of it is non-agricultural in character.

Instead of being utilized, stream waters are to a large extent allowed to go to waste, and even to cause destruction where they should be of service. In 1912 the Commissioner of Corporations estimated the total stationary power developed in the United States at some 30,000,000 horse power, of which water power formed approximately one-fifth. He estimated the additional, unused horse power then capable of profitable development at about 19,000,000 horse power. The amount now available probably is somewhat greater, and for various reasons it will continue to increase. Electrical transmission is one of the influences which is increasing greatly the availability of water power. Formerly, water power could be utilized only within a few hundred feet of its source. Today hydro-electric energy is transmitted two hundred forty miles in Southern California, and a single water power could, if sufficient, serve an area several times as large as Illinois. Constantly to waste this enormous amount of available power, without its benefiting anybody, is in itself most regrettable. But failure to use this perpetual resource involves the heavy consumption of the non-renewable mineral fuels. The amount of coal required to produce one horse power per hour varies from 1 to 7 or more pounds, according to the quality of the coal and the efficiency of the engine. An average of 3½ pounds per "horsepower-hour" would mean 12,600 pounds, or about six tons, per year, assuming 300 twelve-hour days. Therefore, if we were to utilize the available 19,000,000 horse power for purposes for which coal now is used, we could save some 114,000,000 tons of coal yearly, worth, at $3 per ton, $342,000,000. Furthermore, the development of the power in a river may promote its navigability, may render it more valuable from the standpoint of irrigation and of water supply, and, where storage reservoirs are involved, tends to make floods along it less numerous and less severe. Thus the utilization of the available water power of the country would be "multiple conservation." The Federal Government has expended upwards of $300,000,000 on the improvement, or so-called improvement, of inland waterways for navigation, and prospective expenditures equal or exceed this amount. It is safe to say that two-thirds of the vast sum expended virtually has been thrown away, and that most of the projects now under consideration ought not to be undertaken.

Surely the reckless waste of some of our natural resources is a reflection on American intelligence. It is high time that many reasonable, practicable, reforms were instituted. And in this connection it is noteworthy that the success of the conservation movement rests largely with the individual. In a course of lectures at Yale University three years ago, Professor Swain of Harvard said: "All the preaching in the world, all the lectures, books, or magazine articles, will do little good until the problem is brought home, in all its seriousness, to the consciousness of the individual. The problem will be met not alone by newspaper articles, meetings of societies, or the reading of papers or publishing of books on conservation, but only as the individual man may be made to realize the situation and realize it keenly, and as he may be made conscious of the necessity for doing something, and of what he individually can do.

"The real problem of conservation, then, appears to be to bring the situation, the necessity for action, and the remedies which may be adopted, to the consciousness of the individual. This, of course, is promoted, to a certain extent, by publicity, by holding meetings, by the writing of books and papers; but we all know how little such things affect the individual, unless something more powerful is brought in to reinforce them. Books and papers may be read and then put away or thrown into the waste basket, and the extravagance goes on as before. * * *

" 'Wisdom,' said Bulwer, 'is an acquisition purchased in proportion to the disappointments which our own frailties have entailed upon us. For no one is taught by the sufferings of another. We must ourselves have felt the burning in order to shun the fire.'

"Shall we then, have to experience the pinch of actual want before we learn to provide for the future? Shall we see our natural resources squandered, our forests destroyed, our fuel supplies depleted, before we become conscious of our duties to generations yet unborn? Or may we give evidence of the greater wisdom which is shown by the capacity to learn from the experience of others, so that by a study of history and by a serious consideration of our present conditions and tendencies we may avert disasters which are threatening, and which, unless guarded against, will inevitably come upon us?"

The general principles which should govern conservation differ with different classes of resources. Soils are replaced by the weathering of underlying rocks, but on the average at the extremely slow rate of one inch in 500 to 800 years. The foremost principle of soil conservation requires that it be not allowed to wash away more rapidly than it is renewed. Since man depends, directly or indirectly, on soil for most of that which he eats and wears, the preservation of the soil is the most important problem of the conservation movement, and it depends very largely on individual landowners. The second principle of soil conservation requires the keeping in the soil of the mineral matters needful for plant food. In most cases the natural processes of soil enrichment fail to offset the drain on the soil imposed by ordinary methods of agriculture. On the other hand, the reduced yields of many long-cropped soils doubtless are due in part to causes other than the impoverishment of the mineral elements of plant food.

As already indicated, the mineral fuels are non-renewable; whatever we use or waste of these resources, reduces by so much what is left for ourselves and for later generations. Accordingly, economy and frugality should here be the guiding principles. All waste in production and use should be eliminated; consumption for non-essential purposes should be discouraged; where practicable, more abundant, less valuable, or best of all, inexhaustible, substitutes should be used. Like the mineral fuels, the metals are non-renewable, but for many important purposes they may be used repeatedly, with relatively small loss. To mine copper ores, for example, and to obtain the metal from them, is to capitalize natural wealth, and to render the metal available for indefinite use. Broadly speaking, therefore, the production of the metals should be encouraged and facilitated, not restricted. The elimination of wastes and the reduction of losses in mining, concentrating, and smelting, and use, so far as practicable, in ways which prevent or minimize deterioration and permit repeated utilization, should be the guiding principles in conserving the metals.

Our forest resources may be renewed, though slowly. Fully stocked stands of valuable species should be maintained on all non-agricultural lands whose highest utilization is for growing timber, and on critical areas to reduce soil erosion and help regulate the flow of streams. In order that this may be done, various reforms must be carried out as rapidly and fully as business conditions warrant. Especially the fire hazard must be reduced greatly, and in most of the forested states the laws taxing timber must be changed. Only a well-organized patrol system adequately can protect the forests from fire, and experience clearly has shown that such a system is insurance at a relatively low cost. As applied to timber, the general property tax is illogical, unjust, and alone sufficient to prevent the conservative management of most privately-owned forests. Repeated annual taxation of the standing timber leads to early and wasteful cutting, and in many quarters almost prevents the growing of new timber. Doubtless it would be much better to tax forest land at its value as bare land, and subject the timber to a "yield tax" when cut, with special provisions to discourage cutting trees *before* they are mature and to discourage failure to cut them when they *are* mature. Such provisions as last mentioned would be in keeping with an illuminating statement made by Professor Bailey Willis, of Leland Stanford Jr. University, which is applicable to most things that grow. "Conservation", he said, "means that that which is ripe shall be used, whereas that which is not ripe shall be neither used nor destroyed, but shall await the time of maturity." Another pressing problem in forest conservation has to do with the development of markets for the relatively low-grade material for which at present there is little or no sale. This will go far toward making possible desired reforms in logging and milling. Impressed with the importance of this matter, a Vice President of the American Forestry Association declared that forest conservation had come to be more a question of salesmanship than of forestry.

The problems of the control and utilization of surface waters are concerned *directly* with questions of water power, navigation, irrigation, drainage, floods, and municipal and domestic water supply. A single river may have importance in all these connections. *Indirectly,* many other questions are likely to be involved and all should be considered in their mutual relations. Too much in the past there has been a tendency to consider *only floods* in connection with river-control, and *only navigation* in connection with river improvement. Commenting on the narrow view commonly taken of river problems and especially on the general neglect of soil erosion on tributary slopes as a factor in many such problems, a civil engineer recently wrote: "United States Army engineers have spent a great deal of money dredging harbors, removing sand bars and setting beacons for the sake of navigation. The mud they dug was of no interest to them. Other engineers have spent other large sums in chaperoning unruly rivers across the map so that they could successfully carry their silt along to fill up the harbors again. To them the mud was merely a menace to fill up their channels during low stages of the river so as to cause it to seek new channels during freshets." Certainly many millions of dollars have been thrown away by the government in various ways in so-called river improvement. In the future, no improvement should be undertaken until it is certain (1) that it is practicable from an engineering standpoint, and (2) that the benefits will justify the expenditure, but in the latter connection *all* the benefits to be derived from the improvement should be considered. In the case of water power, the greatest practicable use should be encouraged, for this will reduce greatly the drain on our coal, as we have seen, will stimulate the various electro-chemical industries, and will render available nitrogen of the atmosphere in unlimited amounts for use in fertilizers and in manufacturing munitions. Indeed, no form of enterprise based on the use of a natural resource is more worthy of encouragement than the development of water power; such development, unhappily almost at a standstill for several years, is immediately vital to the agricultural, industrial, and military interests of the nation.

With reference to all resources, conservation should take careful account of economic conditions and business possibilities; unforunately this principle too often has been ignored. Much ill-advised legislation has been urged with the idea of compelling the practice of conservation. Doubtless this has delayed the passage, by Congress and by various state legislatures, of certain wise measures which would permit the judicious development of various resources.

We should remember that unwise, restrictive legislation may do much more harm than good, retarding or preventing the proper development of great industries; that the efficient utilization of resources should be *encouraged,* not *discouraged;* that the proper interests of investors and capitalists should be considered no less (obviously no more) than those of the consuming public; that it is necessary to consider, in connection with any proposed measure, not only "do the principles of conservation demand that it be enacted," but also, has Congress or the state legislature, as the case may be, the legal right to enact it, and that to be effective most legislation regarding natural resources must be accompanied by educational influences. Many good conservation laws have accomplished little or nothing, for the want of an enlightened public sentiment requiring their enforcement.

The conservation movement has accomplished much of a constructive, progressive nature, in keeping with the general principles that have been stated. Particularly gratifying has been the progress along various lines during the last two or three years. In connection with our mineral resources, for example, there has been greatly increased efficiency in the concentration and smelting of ores; many old tailings of copper, zinc, and lead have been reworked; increased quantities of sulphuric acid have been obtained from copper-smeltery gases; secondary metals—old iron, copper, etc.,—have been used on an unprecedented scale; new methods of preventing or minimizing corrosion in iron and steel have been developed; potash, for which before the great war we depended almost entirely on Germany, has been obtained in large quantities by electrical devices from the fumes issuing from Portland cement plants. Vastly more than has been accomplished remains to be done in conserving all resources, but the outlook is distinctly hopeful. If the American people use their resources wisely, adopting the best methods developed by scientific research, we confidently may forecast an adequate material basis for the continued development of our civilization through the indefinite future.

THE MAIN VALUE OF THE RADIOGRAPH IN DENTISTRY.*

BY HOLLIS E. POTTER, M. D., CHICAGO.

The question for discussion at this evening's meeting is not a new one in most senses of the world. All of the ideas presented by the various speakers will sound familiar to a few of you who have so kindly attended, and I daresay that there is not one present who does not run into some of the problems discussed, at least occasionally. The use of X-rays as a handmaid to dentistry has become so widespread that the majority of men in this room now resort to the radiograph every week if not many times daily to make more certain the presence and extent of pathology, whereas five years ago X-rays were used in cases of extreme doubt, cases of rare pathology or when in some sort of a pinch. This widespread incorporation of Roentgen procedures into dental practice is sufficient testimony that something vital has happened. Another five years may witness the routine and universal use of X-rays as a guide to the handling of diseases of the dental pulp and peridental membrane, and this will be the final testimony that this thing which has happened has taken full effect. Today we are building a mile-stone in the practice of dentistry. Behind us is the dentist who attended to the teeth of his patient from the standpoint of symptoms, appearance and efficiency in mastication. Before us is the dental surgeon who, without forgetting any of these points, uses as a basis for all his procedures the added dictums of pathology, local and general. Without going into details it is a safe statement that the scientific world has become morally convinced, and accepts as a truism, that pathologic peridental structures are a menace to the health of an individual and are therefore to be avoided and corrected. To those who do not believe that pathologic teeth are a menace to health X-rays are of little further use than to show the cause of certain local symptoms and to portray certain mechanical relations. To those in the other group X-rays are an invaluable aid. Infections about the teeth are very common and if we thus consider them important, it becomes probable that the greatest field of usefulness for the X-ray in dentistry lies in the various phases of infection. It should be hastily added and perhaps insisted upon that by means of X-rays alone one cannot determine all the truth regarding the pathology of peridental infections, although admitted to be the one most helpful means to that end.

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*Read before the Chicago Dental Society, February 20, 1917.

I am not here to state that the dentist who through ignorance, carelessness or neglect produces or nurses along a root abscess is morally guilty for that act in the same sense as he would be if he mixed arsenic with his patient's food or injected typhoid into his patient's veins, but I would state that if any dentist feels it his conscientious duty to give his patients the kind of service that means the avoidance and correction of peridental infections as well as good functional and cosmetic results, he must make constant use of radiography until some better method of showing peridental disease has been devised. And for the intelligent recognition and application of the pathologic data which is capable of being derived by the X-ray method the dentist himself must become thoroughly familiar not only with the pathology of these infections in general, but also with that pathology as characteristically seen on the roentgenogram. Too much time cannot be spent in the literature on dental radiography and in the study of a large number of normal and pathologic dental radiographs from many different individuals on account of two great factors, namely the normal variations in the anatomic structure of the teeth and jaws, second, the variations in pathologic appearance in infections of different age and virulence. A third and more technical reason is to learn to properly discount variations in technic due to unusual angles of ray projection, improper ray quality, etc. Better than the study of a large number of indiscriminate radiographs, separate and apart from the cases, is the more careful study of fewer radiographs alongside the cases, especially where the pathology is afterward confirmed.

Only after such an exhaustive study of radiographs during which all known facts of dental pathology are kept constantly in mind has anyone the groundwork upon which rational and helpful inferences can be made in his everyday work. During this study the observer unconsciously learns to discount the shadows of many normal structures which at first he confused with the pathologic. He will not be tempted to call the antrum a large cyst nor will he always condemn a lower bicuspid simply because the thinner complex of bone at the exit of the inferior dental nerve gives somewhat the impression of a periapical infection. This groundwork for the interpretation of the normal radiograph before attempting to draw inferences as to pathology is just as important as in microscopic anatomy and microscopic pathology and for the same reason. First, the grosser infections about the teeth become automatically recognizable at a single glance. Later the careful observer gains so firm a mental impression of the intimate bony investments of the teeth as seen radiographically than he is able to estimate very accurately whether there is the slightest degree of bone disturbance about a questionable tooth. Finally he will begin a process of differentiation among the positive cases and will assign more specific values to the various radiographic appearances, verifying the same wherever possible by microscopic section or culture.

Give him then a series of *detached radiographs* of peridental infections and he will segregate for you the cases that were *acute* from those that were *chronic*. *One* will give him evidence that the infection process is *arrested,* another that it is *walled off,* another that it is going on toward a *cure* and another that it *is cured*. He will appreciate at once when the infection was primary at a certain tooth or secondary by extension, he will note the lateral infection caused by perforation, infection caused by the deep extension of a *pyorrhea pocket,* infection associated with disease of the antrum. His observations on the healing process where the infection has passed its maximum, the free pus has disappeared, and a stage of imperfect healing has arrived, will oftentimes enable him to detect *granulomas*.

The program has been so laid out tonight that the men following will present in detail the important points in diagnosis, mistakes in diagnosis and limitations of this work and I presume they will be fairly thankful if I do not try to spill their thunder.

I have tried to make the point that it is in the field of the peridental infections that the roentgen rays may be of the greatest assistance to the conscientious dentist and that the more he knows about pathology and radiography the more times he can be led and the fewer times misled by X-rays in his daily work. At the present time there is no gainsaying the proposition that our present method of using X-rays is inadequate. Many mistakes are made. The radiographs *themselves* do not *develop out* all labeled for use, and the notations which are frequently found on a card at the side of a film are often more misleading than the radiograph itself. What should, and what will be the future ideal method of handling the proposition? The answer to a great extent lies in the hands of the management of dental colleges. Tomorrow with its oncoming practitioners must bring us men who learned at school to grasp all there is good in X-ray work without falling into some of the pitfalls which are hindering many today who had no such advantages when in college. Let the student be required to learn the fundamental principles of what might be called "radiographic pathology" before calling his education complete. Upon graduation he will at least be familiar with the following concrete propositions which some of us who grasped this matter from the top rather than from the bottom can never seem to absorb.

First, X-rays of proper quality are able on emergence from a complex of human tissue to record on sensitive emulsions slight gradations in adjacent densities. Applied to the complex of bone and soft tissue of the jaw and more specifically to the bony investments of the teeth and most specifically to infections of the pulp and peridental membrane, an area of increased transparency means a loss of bone and the substitution of a softer material, sometimes pus. An area of increased opacity to the rays means that the normal spongy bone has been replaced by something more dense. If of spongy texture it is reconstructed bone, of homogeneous, it may be a bone scar or a secondary degenerative calcification.

Second, In the first stages of a bone infection as about a dental apex, inflammatory changes do not at once produce gross bony liquefaction. Thus the early radiograph may be entirely negative or contain findings too slight or too diffuse for recognition. After a few days or a week there will have been sufficient decalcification for recognition on critical radiographs.

Third, During the development of the infection and in fact until it reaches its ascendancy pathologically the radiograph at the affected area will show a diffuseness combined with a poorly limited margin. It is only when the process becomes chronic that the limiting walls of the excavated bone are well demarkated.

Fourth, Given a well-developed chronic periapical abscess and it may remain practically constant as seen radiographically or it may be observed to gradually extend. If at the limiting margins there appears a circumferential ring of more solid bone the infection has been arrested and is walled off or encapsulated.

Fifth, When completely healed the cavity of a periapical abscess becomes completely filled in with mature bone, usually involving a reconstruction rather coarser than the original. Between the time it is a chronic abscess filled with pus and the time it becomes refilled with bone the contents of the cavity are that of a granuloma, at first grossly infected and gradually freeing itself from infection as it heals.

Sixth, While chronic abscesses frequently turn into granulomas, these granulomas seldom heal spontaneously so that the bone cavity becomes obliterated and completely healed but the cavity most often persists, filled with this soft granuloma, unable to entirely subdue the infection and carry off the products of infection.

Seventh, In speaking of periapical absorptions it is not proper to call them all abscesses unless one is able to differentiate between the pus sacs and these infected granulomata, which by X-rays is manifestly impossible in many cases.

Seventh, Wherever the radiograph shows a periapical cavity the burden of proof rests on the side of those who may maintain it is not infected, for even these granulomas should be classified as infections broadly speaking, and have a great tendency to light up into acute abscesses again when tampered with.

The student graduating from dental college who is well founded in the fundamentals of his radio-pathology will be able to grow with the subject through the literature and the experience derived from his daily practice, and this brings us to one more general point and that is a practical one. Assuming we in the future are entirely capable of assigning the correct valuation to our X-ray findings how shall we practically produce them? There is no doubt that this can be done in two ways, by operation and by co-operation. Either the dentist must make a hobby of the technical end of this thing or he will not get radiographs which are worthy of studied interpretation. No X-ray technic is easy but dental radiography can safely be said to be among the easier branches. Either the dentist must sacrifice considerable time and give as much attention to this as to any other technical procedure he uses or he must co-operate with some one else who also attends to the wants of other dentists. Such a person should be not only a radiologist but also a dental pathologist. His attitude toward each patient should be purely scientific in that he is working toward the same diagnostic information as the dentist who referred the case, for as far as this case is concerned he is his assistant. By co-operation a group of dentists can command the best efforts of a competent assistant who devotes his whole effort towards radiographic diagnosis. The relationship should be so close that all concerned can speak freely and understand each other's terms, for radiography is a branch which has not yet developed a uniform nomenclature. In co-operation of this kind the X-ray end must be so organized that the patient may be returned for radiographs as frequently as desired to follow up the trend of an infection, to check up root canal work, etc. All this repeat-and-follow-up work may have to be done at a very nominal charge and with the proper organization it can be, since the main expense to this work is the value of time and much of the detail can be handled by unskilled workers after the exposures are made. It is probable that by some such system of co-operation one dental roentgenologist could comfortably care for the work of thirty to fifty men, even though they used X-rays as often as they thought advisable, which would be pretty often under these circumstances. This plan in no way argues against any dentist caring for his own roentgen work, it is merely an economic question whether it would pay him to give time and space to the work if a satisfactory co-operative plan of this sort could be instituted.

But after all is said and done the chances are that if we could look back from a far future date it would appear that the greatest function that X-rays performed for dentistry resulted from its lessons to the medical profession, to the lay public and to the dentists themselves that infection in the tissues about the teeth exists far more commonly than was suspected, that many of them were overlooked and even produced by the dentists themselves, that as a class these infections were rightly considered a menace to the individual's health and as such required correction and avoidance. and last of all, let us hope that it will be said to have constructively aided the dentist, in adopting such a proper method of procedure in all his work that should infection occur it will be accidental and not through ignorance or neglect. When this time does arrive and it is approaching rapidly, then there will doubtless be far less need for X-rays in dentistry.

INCORRECT INTERPRETATION OF THE DENTAL RADIOGRAPH.*

BY. DR. F. D. LEACH, CHICAGO.

Mr. President, Members of the Chicago Dental Society, Ladies and Gentlemen:

Whenever there is advanced into any field of endeavor, a new and useful theory, practice or improvement, there is, as a general rule, a tendency of the major portion of those whose welfare is influenced to the greatest degree, to place an over-amount of confidence in such an advancement, really depending upon it entirely as a foundation for all their judgments.

Placing all of the eggs in one basket is not the most conservative method in any line of procedure.

In many cases of the past two or three years, has the dental radiograph been called upon to bear the weight of decision. Generally, where the case has been studied carefully, the radiographic and clinical findings, compare quite well.

Frequently, however, errors are made and teeth sacrificed because someone has interpreted some shadow in the film, incorrectly.

It must be kept in mind that the radiograph is simply a shadow picture, recording on the film the various densities of the structures through which the X-ray passes, attacking the photographic emulsion to a greater or less degree, depending upon these densities.

All dark outlines upon the film do not necessarily mean that there is or has been a pathologic process, which has caused a rarefaction of these particular areas. There are a number of anatomical shadows which must be considered and not be interpreted as something abnormal.

Sometimes it is possible to project the apices of one or more of the upper anterior teeth, toward the shadow of the nasal opening. This outline has been mistaken for a large destruction of bone in this area.

In a like manner the shadow of a portion of the antrum is often superimposed at the ends of the roots of the molars and bicuspids and is liable to be interpreted as a large pathologic cavity.

Frequently in making radiographs of the lower bicuspids, a sharply defined shadow of the mental foramen is found placed just at the apex of one of these roots and if it so happens that the teeth are pulpless, it is very difficult to be sure that there is no pathologic condition present. One is generally guided, however, by a well marked tracing of the mandibular canal, leading up to this foramen.

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*Read before the Chicago Dental Society, February 20, 1917.

The anterior palatine foramen, situated to the lingual and between the apices of the upper central incisors rarely causes any confusion in attempting the diagnosis of conditions at the ends of the roots of these teeth, as it is generally a well defined triangular shadow, directly in line with the suture of the maxillary bones.

In some cases the foramen is located to the right or left of the median line and casts a decided circular shadow, which if it happens to be superimposed over or near the apex of one of the centrals, might be misinterpreted as a rarefied pathologic area.

There appears, once in a while, a sharp shadow at the apex of the lingual root of the upper first or second molars, which may be the outline of the posterior palatine foramen, which has either been projected forward on the film or is abnormally placed. It is well to keep this opening in mind, for when it does present a shadow, the decision is difficult.

Frequently a radiograph is made of a certain tooth which has been giving trouble, and there appears about the apex a definite rarefied area. The tooth may have been tested for the vitality of the pulp and no response obtained; upon opening into the tooth, the pulp is found vital but not very sensitive to instrumentation. A radiograph in another position revealed a large area including two or three proximating teeth, in one of which the pulp had died, causing the bone destruction and a sinus directly over the apex of the first tooth suspicioned.

Many incorrect interpretations would be avoided by making two or three exposures at different angles, thus affording all the information obtainable from the radiographic examination. The single film of the area in question may be often misleading.

Attempts at diagnosis from films in which the shadows of the structures are distorted is the cause of many of the errors of interpretation. The dentist must learn the difference between a poor and a good radiograph and the radiographer must be honest with the dentist, patient and himself and try to render the best service possible.

Be conservative with the radiograph as an aid in diagnosis. Keep in mind those anatomical structures which may be misleading. Remember that the radiograph is only a flat shadow record and that two exposures may contain more information than the single film, and that it is better to rely upon clinical evidence alone than from a diagnosis made upon a distorted radiograph.

THE CORRECT INTERPRETATION OF THE RADIOGRAPH.*

BY FREDERICK F. MOLT, D. D. S., CHICAGO.

The interpretation of a Roentgenogram sifts down to a matter of personal equation; one person will read a great deal more in a given negative than another, and therein lies one of the greatest dangers in radiography, namely: over-interpretation. Dr. Johnson in a very recent editorial and also in one, two or three years ago, sounded a warning that has much justification, by calling upon those in that special work to be conservative in their condemnation of teeth on the strength of rarefied areas, as shown by the X-ray.

Every day patients are rendered edentulous or nearly so; every day teeth susceptible to salvage are condemned on the strength of poor radiographs, or misinterpretation of good ones.

On the other hand, through inability to interpret properly the findings of the X-ray, dentists frequently spend wearing hours trying to make useful teeth that are manifestly unsavable; and through extreme conservatism do great harm to their patients by their failure to eliminate foci of infection which, in the light of present knowledge, should be done away with. I use the term "present knowledge," advisedly for I feel that our pathologists still have a great field for investigation and research, and that time will bring us many added facts as to what conditions exist during and following abscesses of the teeth.

The radiographer is called upon therefore to interpret his findings to the extremely conservative dentist, the extremely radical dentist and to those occupying a middle ground.

Interpretation to the patient should be in every possible case eliminated; discussion, with a referred case, of the conditions found, is unpardonable and withal a useless proceeding, for a very few only have the technical knowledge, or the balance to understand thoroughly what is told them and they draw unreasonable conclusions, frequently to the detriment of a practitioner not at all at fault.

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*Read before the Chicago Dental Society, February 20, 1917.

Interpretation without a clinical knowledge of the case, and without being versed in the anatomy, and histology of the parts is always difficult and frequently impossible. Therefore if dentists in referring cases would say "I suspect such and such a condition," or "I am looking for so and so," the radiographer would have a definite hypothesis on which to work and, knowing his parts, would, if necessary, make several exposures to prove or disprove the supposition. But having no such basis, he makes one negative, possibly, finds it perfect in detail and considers his work ended.

No written diagnosis of "pus pocket," "gross infection," etc., can quite take the place of a complete discussion of each individual case with the dentist in person, or by telephone, the dentist referring to his negative, the radiographer to the duplicate in his files; the dentist having clinical knowledge of the case, and the radiographer interpreting his findings. Much misunderstanding can in this way be avoided.

The dentist should be aware of the limitations in X-ray work: the radiograph is, literally speaking, a "shadowgraph," a registration of varying densities, on a sensitive film. It cannot differentiate between two bodies of similar density; it has no perspective, except when used in a stereoscopic form, which has not been very successfully done in dental radiography. Various conditions make the making of a radiograph in parts of the mouth difficult and often impossible; for instance the alveolar process and bone in some cases may be so extremely dense that proper contrast is unobtainable, or the molar shadow may be practically impenetrable, or its position such that it is impossible to avoid it without distortion.

Cases frequently present where a plate should be made instead of a film, and others where both plate and film should be made—so that both intra-oral and extra-oral aspects may be compared. So it can be readily seen, that for proper interpretation by the X-ray something more is required than placing the film, turning on the current and collecting the fee; the radiographer should be your assistant in making a diagnosis; not a machine.

A rarified area does not necessarily mean a pulpless tooth, for many pericemental abscesses—so-called—are found on vital teeth. What shall we say of other rarified areas on teeth we know are pulpless, when some of our authorities tell us they are hopelessly lost and others that they are cured and harmless? When one pathologist says no tooth showing a shadow should be retained and another that they should? When our medical researchers find the Streptococcus viridans to be, by metastasis, the causative factor in so many of their troubles, and our dental researchers find him in every abscess they open. If the patient is not showing systemic effects of low-grade infections there can be no objection to an attempt to save a tooth that is diseased, provided also that the patient is aware that the result is in doubt; for Rhein and others have apparently accomplished results with ionic medication that we might class as hopeful if Dr. Arthur Black had not so recently assured us that they don't stay cured, and that they assume their old natures at most inopportune moments—a sort of Dr. Jekyl and Mr. Hyde metamorphosis.

You cannot always differentiate between an acute abscessed condition which has not caused much destruction and a chronic necrotic area with no distinct line of demarcation; you cannot always point out which rarified area is of a cystic nature with a walled-off pus sac, and which contains a granulomatous mass. I have curetted hundreds of them and I have yet to see the contents of any one that I would designate as "scar tissue," or new bone. Perhaps this granuloma is not always infected—for it isn't always possible to obtain a culture, but that is one of the things we are looking to our pathologists to determine for us.

A transverse fracture of a root cannot always be shown, although after a few days such a fracture usually separates so that it is more apparent.

A perforation in a root, unless there is much loss of tooth structure frequently cannot be determined without the insertion of a wire, and then if the perforation happens to be lingually or labially it requires pictures made at unusual angles to show the condition.

Some canal-filling materials are not opaque to the X-ray, therefore canals in which they have been used appear to be unfilled. These materials, however, are usually of such a nature that such a canal filling is undesirable and if possible should be replaced.

It is possible I think for a canal filling of gutta percha to be perfect, and yet the line so attenuated that it is not possible to trace it to the foramen, in the radiograph. If there is no apparent trouble it is inadvisable to interfere with such a filling, unless important superstructure is to be placed on the tooth.

Mental and palatine foramina can usually be distinguished from rarified areas though radiographs made at different angles may be necessary for positive dignosis.

Pyorrhea lesions are apparent through loss of process and the salvability of the tooth depends upon the extent to which destruction has advanced. Authorities agree that if two-thirds of the process is gone the tooth cannot be saved, in spite of which we frequently hear of dentists who can save them if the process is *ALL* gone.

No definite rule can be laid down as to abnormal conditions, except that knowing the normal, the competent dental radiographer can readily distinguish between them.

In closing I would repeat "help the radiographer when possible, by telling him clinical conditions, and accept his radiographic findings," and "make allowances for the occasional cases where ideal results are unobtainable."

LIMITATIONS OF THE VALUE OF THE RADIOGRAPH.*

BY R. I. LEWIS, M. D., D. D. S., CHICAGO, ILL.

Since we have had the "Value of the Radiograph" beautifully demonstrated for us tonight, it shall be my pleasure to touch upon that subject only sufficiently for the sake of clearness in treating upon the topic assigned to me, namely, "The Limitations of the Value of the Radiograph."

I propose to take up this topic in three paragraphs under the following headings, first: faulty technique; second: liability to, or inevitability of, misinterpretation, and third: the dangers of diagnosis. My first shall be brief, my second, I trust, convincing, and my conclusion, I hope, sufficiently forceful to draw your attention to a matter upon which, I cannot help but feel, all thinking persons should take a decided stand.

Now for limitation number one: A dental radiograph may be worse than nothing because of faulty technique. Here all the wiseacres will advise us to send our work only to expert men. Excellent advice, truly, but in passing let us remind ourselves in all humility of the immortal words of Robert Burns, "The best laid plans of mice and men gang aft agley," and take and retake our radiographs, however tiresome and expensive the process prove, until we have produced a film which is technically perfect.

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*Read before the Chicago Dental Society, February 20, 1917.

Would that we could dispose of the second limitation, liability to misinterpretation, as easily. Were it only a question of making a mistake we could study and practice on the thing until we had mastered it, but there are many cases where, as I have hinted before, misinterpretation is practically or almost inevitable.

Do not misunderstand me to be trying to make light of radiography. Scientists accept it, as they do evolution, as a working hypothesis, and none of us could be simple enough to argue against its value for a moment. The idea is simply to demonstrate certain cases whose nature or pathology, call it what you will, sets a limitation upon the value of radiographs or sets of them, taken for the purpose of obtaining a more definite knowledge of those cases.

Let us begin with a quotation from Dr. Raper in the August, 1915, number of THE DENTAL REVIEW, who puts the whole thing in a nutshell in the one apt sentence "The radiograph so often fails to show us what we want to see. * * *" Suppose we want to see a dento-alveolar abscess on an upper central incisor, or on a lower bicuspid, because we have reason to suspect such conditions? It is perfectly possible to mistake the anterior palatine foramen for the first, or the mental foramen for the second, nor do either of these mistakes brand the reader of the film as a stupid fellow. For instance, some peridental lesions cannot be shown at all, because only thickened membrane will make a shadow on the film, and frequently lesions exist without thickened membrane. Lesions around the upper molars can easily evade the ray, due to the fact that the bone is so thick there that sufficient exposure of that region necessarily over-exposes the bicuspids. Naturally the radiographer has difficulty regulating the time so that a sharply defined black and white film will result. To these limitations must be added certain physical ones, such as the age of the patient, the thickness of the bony structure through which the X-rays must pass, and the fact that many bone tumors do not show in a film.

Passing from shadows that we do not always see to those that we sometimes do see, let us remind ourselves that every shadow is not an abscess. Dr. Leach and Dr. Raper have both given us such excellent lists of causes for these shadows which do appear, other than the conventional one of a periapical absorption, that an attempt to supplement those lists might be presumption. However, supposing that the shadow does mean a periapical absorption, we are cautioned to remember that it does not necessarily mean an active infection. I want to show you a slide later on (I will speak of it again) demonstrating post-abscess formation, where the pus sac remains, but is infiltrated with normal bone structure, clearly proving that the tooth was properly treated and the abscess cured.

I have another slide to show at the same time which will demonstrate still another phase of the limitations upon the value of the radiograph. I refer now to certain cases, the preliminary films of which are absolutely valueless unless followed up every two or three months. Conditions are changing, new developments constantly arising, and unless the patient can be made to realize the necessity of the follow-up program the first films are useless. The other film I wish to show demonstrates a tooth thoroughly treated for a root amputation. The root canal was filled and soreness left the affected member, whereupon the patient changed his mind about amputation. The picture, taken two months after the original, illustrates the cured abscess, plus the formation of new bony structure.

The third, and to me, greatest limitation, is entirely curable, but in its present stage renders an X-ray film (however technically perfect) not so much valueless as dangerous. I refer to the written diagnosis with which many radiographers accompany the developed film, and which some, I regret to say, put into the hands of the patients themselves. Possibly I feel strongly upon the matter which has been very firmly treated by a pen far more powerful than mine. I refer now to the excellent editorial on this subject in the February number of THE DENTAL REVIEW. I agree with the writer that a thorough reading of the film is clearer to us than to the physician or the dentist who has referred the patient to us, but I cannot feel that it is right to make a definite diagnosis, especially to the patient, without a consultation. I make a point never to let a patient see a film, for it is mailed as soon as possible to the doctor or the dentist, who not infrequently calls me on the telephone for an explanation.

I have thought it a good plan to consider oneself limited even here, in reading the film for the doctor, and to make a test in all difficult cases before the patient leaves my hands. A tooth containing vital pulp is translucent and pink. That containing a dead one is opaque, and usually clouded to a bluish black. An electric lamp, arranged so as to throw light upon the lingual surface of the tooth will supply means for one test. Another test is to apply a glass high-frequency electrode to the tip of a tooth, which, if vital, will produce a peculiar sensation, because the enamel, like glass, will not insulate the current, which passes to the dentinal fibril. A pulpless tooth will not respond, but care must be taken to avoid contact with adjacent fillings. If, after all my precautions, the doctor or dentist permits the patient to see the film, it is no affair of mine, but on my own responsibility, I should refuse to do any human being the grave wrong of giving him a diagnosis, which *may* be incorrect, and which is sure to be incomplete (since I am not in a position to know the clinical history of the case), and which may result in the loss of one or more of those valuable members, which you and I have spent years in working to help our fellow creatures preserve.

THE PROPER INTERPRETATION OF AN X-RAY.*

BY H. L. LEWIS, M. D., CHICAGO. ILL.

The value of the X-ray as a means of diagnosis is directly in proportion to the skill of the one making the diagnosis.

The negative, if properly taken, conveys more valuable information than any other means at our command, and still it should be taken in conjunction with the clinical findings which experience has taught the dentist he must not overlook.

An opinion based wholly upon an X-ray negative, and without some knowledge of the clinical findings, may not always be accurate.

Such plainly evident conditions as an unerupted tooth, or a well-defined abscess at the apex of a root, are easily recognized, and there should be no reason for doubt, or difference of opinion.

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*Read before the Kenwood branch of the Chicago Dental Society, March 6, 1917.

But where the abscess has recently been drained, and sufficient time has not elapsed in which the area may be filled with new tissue, it is difficult to tell positively that a foci of infection does not still exist.

This may be done however with a reasonable degree of accuracy by taking into consideration an area, of at least ½-inch in diameter, about the apex of the root.

In the immediate area of the abscess one may notice no difference between a sac full of pus, and one that has been completely drained, and it is only by taking into careful consideration the zone of congestion, or engorgement, in the surrounding tissues that the presence, or absence, of an active infection may be determined.

As long as one pus cell remains, bone cells will not be formed, and the area will be filled with inflammatory exudate, or granulation tissue, which can be determined only by the appearance of the zone of capillary engorgement walling in the area as the struggle goes on between the leucocytes and the pus microbes with the consequent absorption of toxines.

This low state of infection might continue for some time, without the patient experiencing more than an indefinite tenderness in the area of the offending tooth, were it not that this constant absorption of toxines produces derangements which lead to the physician sooner or later.

Even after the X-ray has been taken, the dentist, failing to properly interpret the findings, often insists there is absolutely nothing wrong with the tooth.

While many dentists, by this time, are sufficiently familiar with the X-ray negative to secure from it the information needed, it not infrequently happens that the most important item in the negative will be entirely overlooked, or misinterpreted, through lack of consideration of the adjacent tissues.

I refer particularly to the area of engorgement in the surrounding structures, that are always involved to a degree, and which indicates the extent of an infection that is of more importance than the appearance of the root-canal filling, or the condition of the tooth itself, in making an accurate prognosis.

To properly understand a negative, the normal X-ray appearance of the area must of necessity be familiar to the dentist, and he must be able to recognize the angle at which the detailed shadow has been thrown on the film.

He must be able to appreciate, and account for, any increase in density due to overriding structures, such as the malar eminence, and the more thick portions of the maxilla.

He must recognize a corresponding lack of density due to the antrum, and dental foramen; and must not mistake them, as is frequently done, for an abscess.

A proper allowance must also be made for any distortion due to slight bending of the film.

Frequently there are developer stains, and even fogging of the negative, to add to the uncertainty and make the X-ray valueless.

Ordinarily any unusual shading, or mottling, of the negaitve, should be given close attention as it may have a pathological significance of the greatest value.

It is this slight alteration in density, due to engorgement of the capillaries in the surrounding tissues, that gives an intimation of what is actually taking place, and is often the only indication of an active state of infection in what otherwise appears as a drained and sterile area about the apex of a root.

Much depends upon the character of illumination with which the X-ray negative is examined.

A light too strong, or bright sunlight, will entirely obliterate the finer contrasting shades in density, and much that is of value in the negative will not even be seen.

The ideal light is ordinary daylight, or a uniform artificial light, that has just sufficient penetration to bring out all the detail.

As a rule a frosted celluloid, or glass, background dissipates the slight contrasting shades, to which I have referred, and detracts from the value of the negative.

I regret to say that a frequent cause for the loss of this valuable sign is found in the niggardly little films with which most operators try to take a radiograph of the teeth.

In a negative large enough to include a radius of at least one inch surrounding the apex, and taken with a fairly low vacuum tube, it is possible to distinguish slight shades in density that would otherwise be lost.

In a negative taken with a tube of greater penetration this shading is entirely destroyed, although the X-ray may be clear cut in outline and look like a better exposure.

There are instances in which no well-defined abscess is shown at the apex of a pulpless root, but in which there will be an apparent thickening of the peridental membrane, and a distinct zone of induration, that unquestionably indicates the presence of a low grade of infection.

It is in these usually unrecognized foci of infection that the danger lies, especially if after the radiograph has been taken the dentist assures the patient the X-ray shows absolutely nothing, when the fault lies in his inability to properly interpret the negative.

It is in this class of cases that a frequent cause for the so-called rheumatism is found, and a general neuritis may give warning of the absorption of toxines.

Looking at well-filled root canals, and complimenting himself on his skillful workmanship, the dentist finds it difficult to see the logic of the physician, who, recognizing in the mouth full of crowns and bridgework a potent source of trouble, feels no scruples in condemning them all.

Of vastly greater importance, than the appearance of the root, is the condition of the bone surrounding it.

Where the process is denuded of periostium and there is a spongy infiltration about a pulpless root, the sooner it is removed the better, regardless of its importance as an anchorage in a piece of dental architecture.

If the dentist is looking only at the area that falls within the scope of a small dental film he will fail to realize in the X-ray all to which he is entitled.

Possibly it may not be out of place in this connection to state a conviction, based on observations extending over ten years, in which I have taken a conservatively estimated total of 50,000 dental radiographs, that entirely too many pulpless roots have been retained simply because the dntist has not fully appreciated the conditions surrounding a root, which nature is trying to get rid of while he is trying to prolong its usefulness.

Often roots denuded of peridental membrane, and projecting into a socket rimmed out by pus cells, and surrounded by an unhealthy process, are anchored into place by an expensive piece of bridgework and are held there a constant menace to the health, simply to gratify the vanity of a patient who should have been honestly warned of the danger.

While I do not approve the radical wholesale condemnation of all pulpless teeth, as it is being carried on by extremists in the medical profession, still I do feel that the advanced dentist who has been conscientious, no doubt, in his endeavor, and has taken pride in his advance, has done too much reconstructive work, where a clean sweep would have at once removed a constant menace to the health of the patient.

I use the term advanced dentist in distinction to the old-fashioned, though probably no less skillful dentist, of not so many years ago, who was possibly nearer correct in his procedure, as he almost ruthlessly extracted everything and held up a "beautiful plate" as the solution of all dental ills.

There can be no question but the health, and lives, of some of our men and women, who can well afford the best there is in the profession, have broken prematurely under the strain of modern dentistry.

How may this be corrected?

How may the dentist be able to distinguish where safely to draw the line between an attempt to save a tooth, and the necessity of preserving the health of the patient?

By means of a proper appreciation of a method of diagnosis already in his hands, and a correct interpretation of the X-ray negative uninfluenced in his judgment by the contemplated work which may run into hundreds of dollars, and which must be sacrificed to the welfare of the patient.

In case he feels any misgiving as to his ability to properly interpret the X-ray, the radiographer, who has received a fair fee for his services, and who will possibly be able to detect something the dentist may overlook, stands ready, and willing, to give him the benefit of his experience.

The dentist is not only welcome to this opinion but he has a right to it, and the patient is entitled to the unbiased opinion of an expert.

The medical profession is more and more making the sacrifice of a prosperous business to the welfare of the patient, as its energies are being devoted to the prevention of disease; and the dental profession, also, must sacrifice much of the modern profitable crown and bridgework, and condemn the old roots that are so carefully nursed along and saved, if he is to profit by what the X-ray unquestionably shows.

PRESIDENT'S ADDRESS.*

BY HENRY L. WHIPPLE, D. D. S., QUINCY, ILL.

Ladies and Gentlemen:

In my address to you, I propose to depart from the customary style of presidents' addresses, usually a reiteration of facts and statements given in articles in our journals pertaining to the progress we are making, and rather, I shall take up matters pertaining to the administration or business end of the present regime, reporting to you actions already taken, actions contemplated or advised and with a regard for the conservation of funds of the society.

The continued growth of the membership and the allied workings with the National Associations seem to make necessary many changes in our present administration action, therefore it is my purpose to offer suggestions for the betterment of conditions, awaiting the approval or disapproval of the society.

My first suggestion is, that a committee be appointed to be called "The Committee on President's Address" to which the recommendations of the President in his address, can be referred and subsequently returned to the general session as a report and action be taken on the floor.

The first and most important topic I have for discussion is that of

FINANCES.

Last year our society contributed to two very important and worthy funds the sum of $1000 each, to the Black Memorial fund and to the Research fund in the National Association. Because of this fact in addition to the regular and usual drains upon the treasury we are all but embarrassed.

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*Read before the Illinois State Dental Society, May, 1917.

Your official family has contemplated many plans for curtailment of expense and during the midwinter session of the executive council these plans were discussed, of some of which I desire to speak, in order that your discussions may guide the members of the council in their future deliberations.

It has been suggested that the Bulletin be issued bi-monthly instead of monthly.

It is suggested that the practice of sending members of the society to local society meetings be discontinued. As it is thought that the membership card is sufficient guarantee of membership, both in the State and National, the issuing of membership certificates other than life certificates should be discontinued.'

It is suggested that, owing to the fact that the society sustains a loss each year of from one to three hundred dollars on the transactions, that the price should be set at one dollar instead of fifty cents hereafter.

Our by-laws provide that three dollars of the amount turned into the state treasury should be retained to defray the expenses of the society but at the time of the reorganization of the National association our society agreed to pay for the first year fifty cents for each member to the National and this is still being done, thereby causing an additional loss to the society of from seven to nine hundred dollars per year.

In my judgment, the secretary of each and every one of the twenty-seven component societies should be instructed and required to send to the State Secretary, the sum of five dollars for each member, two dollars of which is for the National and three dollars to be retained in the state treasury with which to carry on the legitimate business of the society.

You can easily see the necessity for making some radical changes in our methods and I can assure you, if something is not done and done before the beginning of the next fiscal year we will be financially embarrassed if we are not already.

THE OFFICE OF THE SECRETARY.

My heart goes out to the busy practitioner who will accept the call of his society and carry on the duties of the secretary even to the detriment of his own private professional business.

Only he who has served the society in this capacity can possibly appreciate the great personal sacrifice this work calls for.

The present incumbent has been most earnest and efficient and has been a pronounced success, but I am sure that in this, his first year of service, he has asked himself many times this question: "How did I allow them to put it over on me?"

During my tenure of four years in office, I studied out many schemes for the relief of the Secretary and concluded that it was asking a great deal of any member of this society to give the time necessary to carry on the greatly multiplied duties of the office. Because of a peculiar bent I may have for "system" I evolved many changes in the official workings of the office, and it is now so automatic that I am sincerely of the opinion that the by-laws should be amended to make it possible to elect a permanent secretary, a layman who will be bonded, and who will conduct the business of the office to the exclusion of any other business, the work being so systematized that one person can take charge of the entire office if he is other than a busy dentist.

A permanent and competent secretary can be employed for less than is now allowed for the secretary and his assistant secretary.

Should an amendment be prepared and be presented at this session it would have to be laid over until next year and the change should become effective when the present secretary can be no longer prsuaded to accept the office.

I have presented many things of moment that if carried out will save to the earning capacity of the Society more than one thousand dollars per year, and I present them for your approval as coming from your entire official family.

During the past year your President has performed one or two acts which I desire to report.

At the death of our beloved Dr. Koch, a vacancy was caused on the committee on "Legislation and Appointment of Members of State Board" and, as it occurred at a time when this committee could be most useful in advising with the Governor in making appointments and in assisting in the work on the new administrative code, I did not wait for the meeting of the executive council, but immediately appointed Dr. Arthur Black to fill vacancy and appointed Dr. T. W. Brophy as chairman.

The committee met at once and, at a conference with the Governor, rendered much assistance in the reorganization plan, and ultimately for the benefit of the association, as you are already well aware.

With regard to the National Association.

RESEARCH WORK.

Your President, in November, addressed a letter to the President of each local society, requesting him to appoint a soliciting committee to secure subscriptions for this work, and in March I addressed a letter to the several chairmen of committees, urging haste in the work and requesting them to be prepared to make report of collections and to turn over the money collected to the National Committee Chairman at a time to be set apart for this ceremony just prior to the election of officers.

I sincerely trust that this event will be in the nature of a celebration.

CONDITIONS OF THE COMPONENT SOCIETIES.

During the year I have had the pleasure of visiting and participating in the meetings of nine component societies and from what I have seen I can say most sincerely, that, without exception, they are wideawake to all that pertains to progressiveness in dentistry, and in fraternal companionship.

During these stirring times, whether of one faith or another, we can see our duty plainly and as men and Patriotic Americans we are with the President of the United States unitedly.

The honor of our country is first and uppermost in our minds and in our daily work. We can think and instill into the hearts of the younger generation a love of country and of the flag, our beautiful symbol of independence. May it ever float, unsullied and glorious.

We as dentists can do our share in making possible the enlistment of recruits with mouths in fit condition to pass the rigid physical examinations.

We should all become members of the Preparedness League of American Dentists. The slogan of this league is, "Of our profession, for our profession and for our country if need be."

Of the classified objects of the league, the one object, referring to the "Caring for the teeth of candidates for the Army and Navy by members of the league" can be our individual service if we so choose.

To put this society on record, letters have been addressed to the commanding officers of the Central Department of the Army and Navy over the signature of your President and Secretary, offering the complete list of our membership that they may designate at each recruiting station dentists who will each take charge of one candidate and put his mouth in condition to make his enlistment possible, and I hope, should you be called upon, you will have pleasure in rendering this service.

Should you desire to render still greater service, make application for membership in the Officers' Reserve Corps, Dental Section, and prepare to serve your country in your most useful capacity.

If you can qualify you should do this at once. The general training in the Dental Surgery of war will make you valuable to your country. The dentist in this service receives the rank of First Lieutenant and a salary while on duty of $2000 per year. Should you be interested in this plan of serving your country, you should communicate at once with the League Headquarters, 131 Allen street, Buffalo, N. Y.

THE ILLINOIS PUBLIC SERVICE INFORMATION BUREAU.

One of the things most vital to the interests of this society, is the frequent efforts made by legislators to change our dental laws at the suggestion of certain lobbyists, often to the detriment of the ethical practitioner, and I desire to call your attention to the very efficient service rendered weekly by the Illinois Public Service Information Bureau, through its Secretary, Mr. R. M. Sullivan, of Springfield.

This Bureau keeps its subscribers informed by weekly bulletins as to all laws being enacted and should our President and Secretary and the members of the Public Service Commission receive these bulletins regularly, our interests would well be conserved, their constant attention to the laws proposed rendering the possibility of passing bad bills without our knowledge impossible.

The cost of this weekly service to our society would be three hundred dollars for the legislative term and it would seem to me to be money well spent. I therefore recommend that this service be subscribed for.

May I close by extending additional and fraternal welcome to the members of this society? Our Mayor has greeted you with an expressed desire that you may find pleasure in your visit to Quincy, and should I express my desire, both your pleasure and your benefit from attendance shall be best conserved by a constant and attentive presence at all the sessions.

Your program committee, Dr. T. A. Broadbent, has provided you with a rare literary treat, and the clinic committee, Drs. E. F. Hazell and F. F. Molt, have likewise worked untiringly to assist in making the Fifty-third Annual Meeting interesting and instructive.

The local arrangement committee, headed by Dr. W. L. King of this city, stands ever ready to answer your slightest wish. You must above all things feel at home.

I do not wish to close my address without expressing my deep appreciation of the honor conferred upon me at the close of the 1916 sessions, an honor to be coveted by every one. I can assure you it is most fully appreciated, and I shall ever look back upon it with a feeling that it was one of the proudest years of my life.

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.*

BY DR. R. H. DANIELS, PEORIA, ILL.

To the members of the Illinois State Dental Society:

The committee has not made a collection and exhibit of the various articles invented during the past year.

The manufacturers have been very kind in supplying information and literature regarding the new inventions of the year and I have made the description of each article as brief, and at the same time, as explanatory as possible. It has been suggested to the manufacturers to have the articles on exhibit with the various dealers at this meeting. For some unknown reason, some manufacturers did not send a report to the committee, so it was impossible to get a complete report of all the inventions that have been put on the market during the past year.

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*Read before the Illinois State Dental Society, Quincy, May, 1917.

American Cabinet Co., Two Rivers, Wisconsin.

(1) The Proficient Prophylactic Cabinet No. 99.

A lost motion absorber designed especially for those who specialize in the treatment of Pyorrhea and Prophylaxis. Its completeness is a practical time saver in the hands of one who practices preventitive dentistry.

(2) The No. 100 Cabinet.

Used for general practitioner (same size, shape and finish as Prophylactic cabinet). Its compactness of design places every desirable appliance within instant reach of the operator and eliminates the accumulation of unused instruments and materials.

(3) Waste Receiver.

Mahogany or Oak—deep enough so the waste is entirely out of sight and the waste can be removed without handling and does not come in contact with the wood. A paper bag is attached on pegs. Remove the pegs—throw the waste away with the bag.

(4) Drinking Glass Cabinet.

It is made of genuine mahogany with mirror back.and glass shelves to hold one dozen glasses.

American Water Supply Co., Boston, Mass.

(1) No. 3. Standard Medicine Cups.

A standard high-grade cup with patented reinforced bottom.

(2) No. 160 Special Dental Cup.

(3) No. 170 is the latest production.

It is a one-piece cup, having a round bottom.

Harry J. Bosworth Co., Chicago, Ill.

(1) Instantaneous Sterilizer for Root Canal Workers.

With this sterilizer—which is operated in front of the patient—you can take a broach with cotton wound on same and sterilize the canals.

(2) The Bosworth Adjustable Bracket Realite.

With this lamp and bracket the operating light problem is solved.

(3) Dentist's and Physician's Scale.

Keep a record of your patient's weight in treatment used in diagnosis.

(4) The Bosworth Prophylaxis and Root Canal Treatment Cabinet.

Made to carry the Carr set of instruments and material.

(5) The Bosworth Dental Cabinet.

The ideal cabinet for the narrow operating room, only eleven inches deep, yet has a large working surface, being forty-five inches wide.

(6) The Bosworth Office Desk.

An ideal desk for the office where little space is available.

(7) The Bosworth Wall Cabinet.

For use in the second operating or extracting room, or used in regular operating room as crown and bridge bench.

(8) The Bosworth Real Bunsen Burner.

(9) The Bosworth Laboratory Bunsen Burner.

No rubber tubing; has adjustment for size of flame.

(10) The Bosworth Aseptic Waste Cotton Holder.

Attached to back of chair in a handy position.

(11) The Bosworth Switchboard Canopy.

Dress up the switchboard and make it look the part by putting on these canopies.

(12) The Bosworth Spray Heater and Bracket.

Consolidated Dental Manufacturing Co., New York City.

(1) Aseptic Tray Table.

Comprises two tables in one permitting the operator to have a fresh and clean table for every patient.

(2) Rubber Dambright.

A bright amber colored dam with exceptional strength.

(3) Red Modelrite.

A modeling compound.

(4) Dentist's Receipt Book.

A receipt book for cash received combined with the Triggs Chart System of keeping accounts.

(5) Davis Crown Root Set.

Consisting, one set of (3 Davis Crown Rreamers, 1 Davis Crown Counter-sinking Facer, 1 Davis Crown Counter Base Reamer).

(6) Empyr Pyorrhea Syringe (all glass).

(7) Standard Assortment Finishing Strips.

(8) Chair Oil—Speedwell Lubricating Oil.

(9) Chip Blowers.
(10) Vitryx Cement.
(11) Shade Guide.
(12) Tempo-Tite (Temporary stopping).
(13) Carr's Polishing Powder.
(14) Paper Head Rest Pads.
(15) Portable Head Rest (Pads in leather).
(16) Improved All-cord Engine.
(17) Right-angle Handpiece Attachment.
(18) New Molds—Goslee Teeth.

Colgate & Company, New York City.

(1) Specimens of educational material that are typical of the best kind of propaganda carried on by a manufacturer to spread the message of "Good Teeth—Good Health."

Electro Dental Manufacturing Co., Philadelphia, Pa.

(1) New Electro Dental Compressor Cabinet for containing the Electro Dental Air Compressor.

The cabinet is finished in imitation mahogany designed with beautiful lines.

Friedman Bros., Chicago, Illinois.

(1) Dental Curettes.

Left, right and hoe shape, cut on three different edges. pushing, pulling and scraping—the angles are long enough to reach the deepest socket of an impacted third Molar.

(2) Head-lamp with Special Mazda Light.

It will follow the eyes of the operator and therefore relieve the eye of the strain to follow the light, which is necessary by bracket or stationary lamps.

(3) Dr. Gallie's Broach Holder.

Enables every dentist to make his own smooth-broaches hair fine. Can also be used for spiral broaches with or without use of engine.

(4) Dr. Dorr's Dental X-Ray Film Holders.

One for upper and one for lowers.

(5) Dr. Youngman's Universal Prophylactic Set of Instruments.

This set consists of a new sickle scaler, 3 sizes of a triangle scaler and 2 left and right triangle scalers.

(6) Dr. LeGro's Special Burs for Porcelain Jacket Crowns.

The bur is a finishing inlay bur with a pin in the end, which acts as a guide to make a uniform depth of the shoulder.

(7) Dr. Hall's Pulp-chamber Excavators.

To remove the calcified deposits in the pulp-chamber. Made in left and right and one forward and another backward acting. These instruments are the most progressive improvement for root-canal work.

(8) Baloptican Machine for Slides.

A new feature which enables the dentist to bring his X-ray pictures to a meeting and show them by the use of this machine enlarged on a wall or screen, without going to the expense of having the pictures enlarged and slides made.

(9) Dr. Chalmers Lyons, Professor of Oral Surgery of U. of M. has designed a set of instruments consisting of 3 chisels and 1 elevator for the use of third molar operations.

Goldsmith Bros., Chicago, Ill.

(1) "Dic" Crown (Curved Pin).

Increases the strength, reduces number of fractures, reduces trouble in adapting.

(2) "Dic" Facing (Flat Pin).

(3) Johnson Crown Remover (Patented).

Will remove a porcelain crown from any part of the mouth with perfect ease. Contains wedge-shaped blades which do the separating. Don't use lateral motion. Don't try to pry crown off; hold firmly with no movement and screw wing nut to the right. Cannot injure the root.

The Halverson Co., Chicago, Ill.

(1) Halverson Electric Sterilizer.

With spray bottle and tumbler warmer attachment that can be supplied with or separately for use on the Halverson Sterilizer. It warms the water in the tumbler and atomizer without any additional expense.

The J. Bird Moyer Co. (Inc.), Philadelphia, Pa.

(1) Reinforced Mandrels.

In polished steel, nickel-plated steel and platinoids. The reinforcements enable you to cut a deeper thread and to have the thread of the screw make a deeper engagement with the thread in the mandrel shank. This increases the life of the Mandrels at least double that of ordinary style.

(2) A new method of mixing cement.

J. W. Ivory Co. (Dental Instruments), Philadelphia, Pa.

(1) Multiple Jaw Cervix Clamp.

It contains four different jaws. One narrow and one broad for ordinary curvical cavities, and one each right and left for cavities that extend around and between the teeth on either side. These fit at the juncture of the bow and are changed easily. This provides for other jaws and any pattern may be attached by this same method.

The clamping principle consists of three jaws which move independently and the slide rest may be placed so it has a bearing at any point on the tooth surface, the bow or upper jaw is carried to position above the cavity margin by the upper screw; this force is sure, yet may be gradual.

Kings Specialty Company, Fort Wayne, Ind.

(1) Dr. William's Ready to use Root Canal filling (opaque to X-Ray).

Non-irritating and easily introduced.

(2) Dr. Williams Devitalizing Paste.

Contains atrodone which overcomes the irritating effects of arsenic. (Is green in color.)

L. D. Caulk Company, Milford, Delaware.

(1) Celluloid forms.

For use in replacing broken facing with synthetic porcelain.

(2) Celluloid Molds.

For use in making synthetic jacket crowns.

Swenarton Stationery Co., New York City.

(1) "Philmounts."

A perfect mount for viewing, filing, handling and protection to dental radiograph films. The United States Patent Office allowed them a broad convincing patent in December, 1916.

The S. S. White Dental Manufacturing Co.

(1) The S. S. White Glass Asceptic Bracket Table No. 3, (Mar. 1, 1916).

The edges are notched for instruments. The table revolves when clamp screw is released but the burner, which is attached, remains stationary.

(2) University of Michigan Prophylaxis Instruments, (April 20, 1916).

Set contains eighteen instruments and are found to cover every requirement.

(3) Angles' New Ribbon arch Orthodontic Appliances, (Sept. 1, 1916).

Correct in principle, easily and quickly applied and positive in action.

(4) Ribbon Arch Bending Pliers No. 142, (Sept. 1, 1916).

So important is the proper bending of the arch that it has made necessary the special form of pliers.

(5) S. S. White Base Plate Rubber, (Nov. 1, 1916).

Maroon, and gold base.

(6) S. S. White Matrix Pliers No. 141, (Nov. 1, 1916). (Invention of Dr. Wm. H. Tuttle.)

The making of matrices for approximal fillings is simplified and shortened by the aid of these pliers.

(7) S. S. White (Oxyphosphate) Zinc Cement, (Dec. 1, 1916).

Which meets every requirement.

(8) S. S. White Vulcolox Teeth, (Feb 1, 1917).

Lock in Vulcanite, the vulcanite becomes interlocked within the three undercut walls of porcelain in the recess. This feature combined with a specially designed platinum pin, forms the strongest attachment of porcelain teeth to vulcanite thus far known.

The manipulation is simple, and grinding at neck or incisal edge does not lessen the strength of the attachment which is internal and has a long bearing. Tooth and plate are interlocked inseparably, no normal stress can disturb them.

(9) S. S. White Mortar and Pestle No. 7, (April 1, 1916).

(10) S. S. White Aseptic Medicament Tray, (July 10, 1916).

(11) Arton's Cleavers, set of seven, (Sept. 1, 1916).

(12) Woodbury-Crandall Instruments, set of thirty-six, (Sept. 1, 1916).

(13) Tumbler holder splash rim, (Dec. 1, 1916).

(14). S. S. White Pulp-Canal Cleaners, with short handles, (Jan. 2, 1917).

(15) S. S. White Drop Bottle, Nos. 10 and 11, (Jan. 2, 1917).

(16) S. S. White Cone Socket handle No. 20, (Mar. 1, 1917).

(17) Stand for Melotte Blow-pipe, (Mar. 1, 1917).

(18) S. S. White Pink Base-plate Wax No. 5, (Mar. 1, 1917).

(19) S. S. White Yellow Base-plate Wax No. 6, (Mar. 1, 1917).

Dr. Arthur E. Smith, Chicago, Ill.

(1) Hypodermic Syringe.

This syringe is made of metal and glass and in it is incorporated a number of features which are of great advantage to the operator. It also has a set of five (5) iridio platinum needles. This syringe is efficient in all phases of Local Anaesthesia, namely Nerve Blocking, Intra-osseous, Terminal or Infiltration and Peridental methods.

(2) Sterilizing Jar.

For appliances to be used in Nerve Blocking work. This sterilizer is of neat design and contains a porcelain rack which is suspended in the anaesthetic solution upon a ledge which is cut on the inside of the sterilizing jar. The rack provides for all syringes, needles, forceps, scissors, dissolving cups, etc., which are sterile and ready for use. The applance is free from metal, thus avoiding contamination.

(3) Automatic Still.

This still is automatic in every respect and needs absolutely no regulating and one can "still" water as long as he desires without watching it. The still is small and has the capacity of 150 to 200 minims per minute.

(4) Novocain-Suprarenin-Ringer Tablets.

These tablets have been perfected after nearly two years of research work by the writer and a number of prominent chemists. The tablet eliminates the undersirable stock Ringer's Solution which has been used in the past. The tablets contain all the necessary ingredients to give the dentists the proper amount of Novocain, Suprarenin, at the same time giving him a fresh Ringer's Solution. This tablet has stood the acid test of practical application, as well as the various tests in the physiological laboratory made upon animals and is endorsed by the leading men as being absolutely scientific.

We urge you to visit the various dealers during this meeting and get more information concerning these and many more articles which they have, as your committee was able to give you only a short description of the eighty-one new things reported.

WHERE AND WHY USE THE PULP CHAMBER GOLD INLAY.*

BY W. E. MATHISON, D. D. S., CHICAGO, ILL.

It is my desire to make as clear as I can where and why in my opinion the pulp chamber gold inlay is preferable to a gold shell crown from, I believe, every standpoint.

If a case comes under my care where a molar is extensively decayed and the pulp must be devitalized, I do not always place a gold shell crown. Where the buccal and lingual walls are in good condition or many times where the buccal or lingual wall remains, being of sound tooth structure, the pulp chamber gold inlay is a service that is most satisfactory, especially in close bite cases. It is a self cleansing tooth, you can get almost perfect margins, procure proper contact, preserve the interproximal space as well as insure the best possible occlusion. I would like to say here that I believe there are more ill results from unnecessarily blocking the interproximal space than is commonly thought. In my opinion it is of the utmost importance that we preserve a normal interproximal space, that foods may not become wedged between the teeth and impinge on the gums, which is to say the least contrary to nature, and the result may be serious.

To properly prepare a root to receive a crown is at the best an irritating procedure. I believe that I am safe in saying that in most cases it is a mutilating one. We do know that to properly prepare a root is a task that consumes considerable time, it is nerve-straining to the dentist and of prolonged discomfort to the patient.

In preparing such case for a pulp chamber gold inlay restoration, proper preparation can be accomplished in much less time without mutilation to the tissues and with minimum discomfort to the patient. Permit me to say in this connection that too much stress cannot be laid on the sterilization of the carborundum stones used in root and cavity preparation. If we are to guard against infection and observe asepsis it should be carried out in the strictest sense. It seems to me absurd that we should be so particular in sterilizing our operating instruments, burs, etc., and ignore completely the danger in using stones that come in contact with tissues repreatedly on different patients without sterilization. We owe it to our patients to exercise our knowledge of this dangerous practice, and should eliminate all possible chance of transfering disease. How easy it would be to transfer a specific infection in this way and what a horrible thing to think of as something that could have been prevented.

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*Read before the "Dental Review Club" of Chicago.

We will take for illustration a molar that is extensively decayed involving the buccal and lingual walls one-third toward the gingival. Use a suitable stone to dress the tooth down to a solid base, which extent can be determined only by each individual case; dress the mesial and distal down to the gum margin or slightly below, have the inner walls perpendicular to each other with all margins extending to self cleansing areas. Make preparation well down into the pulp chamber. Generously bevel all margins as this takes care of the enamel rods and adds strength to the work, making it improbable that a wall will ever be broken if properly done. In order that we get the best final results we must see to it that the tooth is so prepared as to allow the inlay to go to place one way only. This can be accomplished in several ways. We will leave that to the discretion of the operator.

INLAY WAX.

In my opinion we have been misled to believe that all of the shrinkage in inlay work takes place in the actual casting process. Closely observing every step in inlay work I have proved to my own satisfaction that it is not a good plan to chill the mould with cold water, because you will experience a certain degree of shrinkage by so doing. To prove this to your own mind, in carving up your next extensive restoration by the inlay method, chill the mould when carved and again press gently but firmly to place, you will invariably notice a cracking of the margins some where about the surface. I think that you will agree with me that if the base was firmly to place this would not happen under reasonable precautions

I have made it a rule to invest inlay moulds immediately upon removing (without chilling) and can report better results from this technic. I use the Kerr blue inlay casting wax. This can be heated either by flame or hot water, personally I prefer hot water. After you have it to the porper consistency press to place in one direction only and carve your case. If the case will permit you can remove the mould and by the use of a suitable bur in the engine remove the unnecessary wax. It is advisable, however, to leave the general outline. I might add here that it is good judgment to run the engine slowly in this step for two reasons, namely, to prevent clogging the bur and heating the wax to the extent that it may be more easily distorted while handling. In preparing the mould for investing use a piece of wax about the size of the lead in an ordinary lead pencil, melt the ends to the inlay at some high point or the contact points, loop in such a way as to permit the force of casting against the margins.

INVESTING.

I do not use cold water in the investment compound because I do not want to chill and probably shrink the wax mould. I use the Taggart inlay investment compound according to his teachings. I feel that it is useless to go into the details of this procedure as we all understand this proper technic, although I do believe some of us are inclined to be careless in this important step. It is impossible to get a good cast if we are not cautious of every detail. I have an opportunity to observe a great many inlay restorations, and although some of them have been serviceable, I believe that I am justified in drawing the conclusion that the operator has been neglectful of the details that go to make up as perfect an inlay as is possible to procure. Evaporating the wax must be done slowly and thoroughly before casting is attempted. Perhaps more mistakes are made in this step of the work than any other.

PREPARING THE CAST.

I use steam pressure in casting. After procuring the cast which is preferably 24-karat gold—never less than 22-karat—I flow 18-karat solder over the contact point, this is sufficiently hard to prevent wearing flat. In the act of polishing we can easily destroy the result of our effort so far, therefore, the utmost care must be taken not to dull or polish away the margins. After the cast is ready for the lathe use tripoli to remove the scratches, after this is done transfer to the rouge buffer and polish. For the final polish which will add luster, give it the acid polish. To accomplish this place the cast over the flame until cherry red hot, plunge into hydrochloric acid, wash, dry, repolish lightly on the rouge buffer. Grooves and pits can be effectively polished with a proper sized bud bur in the engine run backwards.

FINAL SETTING

It would be disheartening after taking every precaution, not to get the inlay to its proper place. But if every detail has had proper attention there is little danger of this possibility. I wish to say that the cementing of our work should be done most carefully. We all know that work placed in the mouth that does not "stick," if you please, is to say the least contrary to good recommendation. In placing work that must be cemented, use a good germicidal cement well spatulated, thoroughly dry the area in the mouth that is to be artificially restored, placed the work in its proper place and have the patient bite firmly on a cotton roll—I use a cotton roll as this tends to equalize the pressure. Instruct the patient to bite firmly and hold jaws very steady for a few minutes. To prevent the case being dislodged by the patient accidentally closing the jaws before the cement has had sufficient time to become hard, I place an ordinary clamp on some tooth. I think it is only common sense and good judgment to hold a cemented piece of work in place for at least five minutes before it be even touched. I have talked with many young men as well as some older practitioners regarding this step in our work and was surprised to learn that they had never given this thing any serious thought. They could recall, however, work that became loose under stress that they had expected it to stand up under. Perhaps carelessness in the cementing was the cause? It is obvious that if a cemented piece of work is allowed to change position once or more times while the cement is of a gummy consistency that that piece of work will in the course of a short time become loose, being subject to the stress of mastication. Particularly is this true in cementing a pulp chamber gold inlay and every precaution should be taken to guard against this possibility.

PROCEEDINGS OF SOCIETIES.

REGULAR MEETING OF THE ODONTOLOGICAL SOCIETY OF CHICAGO, HELD ON WEDNESDAY EVENING. MARCH 7, 1917, AT THE CHICAGO ATHLETIC CLUB.

ESSAYIST, PROFESSOR H. H. BARROWS OF THE UNIVERSITY OF CHICAGO.
ESSAY: "THE CONSERVATION OF NATIONAL RESOURCES."

DISCUSSION.

Dr. J. E. Hinkins:

Mr. President and gentlemen. I have enjoyed the paper very much, but there has been such an immense compilation of statistics and facts that it would be useless for me to try and discuss it even if I had had an opportunity to ready the paper. It has been a source of great pleasure for me to listen to this paper, and I have received a great deal of valuable information from it, and it is really an education to me.

Dr. C. N. Johnson:

Mr. President and Professor Barrows. I want to express my very great appreciation of the fact that we have had an evening on a subject as broad as this—a subject entirely outside of the dental field,—also to express my personal appreciation to Professor Barrows for bringing out certain phases of our industrial situation more clearly to me tonight than I have ever seen them before. I have been impressed, as probably all of you have, with the criminal wastefulness of the American people. In fact, I had an editorial a few months ago entitled "The Great American Crime," and I called that crime "Wastefulness."

Tonight Professor Barrows has drawn a very clear distinction between the loss that is sustained in all of our commercial enterprises, what we might call the legitimate loss, and the wastefulness that goes on,—what might be called the criminal wastefulness. That was more clearly outlined to me tonight that I have ever seen it. I have lamented more than any other one thing the apparent wastefulness of the American people on every hand, and I have felt that a day of reckoning must come to us, no matter how immense our resources were. This paper to me seems almost epoch making. It is the culmination of years of study, years of observation and of practical experience. I feel that the reading of this paper is going to be of immense value not only to the members of this society, but to the profession generally, and to the public. I think that it is something that we need at this particular time more than we have ever needed it. The lessons taught us by the utilization of every resource in the conflict that is going on in Europe is one that we must take home to ourselves and remember.

Dr. J. G. Reid:

Mr. President and Professor Barrows. The only thing I can say is that I have been very deeply interested in the presentation of this paper. I certainly hardly realized the many problems and questions along this line that were coming up in this great big world, nor did I realize the field for discovery or the possibilities before the American people if they only knew how to go about discovering these things. Many things that have been touched on in this paper tonight I never thought of, never even dreamed of, in fact, never had heard or read about. There is so much to read, and naturally individuals read of those things which interest them particularly, and fail to read of those things which ought to be of universal interest because of their importance to all of us, and especially at such times as these. This paper to me is a revelation, and should cause an awakening among us so that we shall have a deeper interest in those things which we have heretofore passed by as trivial, but which we have considered trivial only because their importance has not been called so strikingly and vividly to our attention.

Personally I wish to thank the essayist very much for what he has presented to us tonight.

Dr. L. L. Davis:

Mr. President and members of the Odontological Society. While listening to Professor Barrows I could not but be impressed by the manner in which he drew distinction between the conservation of certain resources and the exploitation of other resources, and his paper this evening has given me somewhat more of an insight into what has been talked of in the legislative bodies in regard to the withdrawal of certain mineral lands, both in Alaska and in various parts of the United States—California and other of the mineral producing states—and he has given an excellent explanation of why the exploitation of minerals, that is the metal elements, under a proper conservation policy, would be a good thing for the country, in that when they are put upon the market they will help build up the wealth of the nation, and their exploitation is not a loss, because they are used over and over again, as compared with those mineral resources which are absolutely lost once they are brought from the earth. It is something that I had never had put before me in such a light as has been done this evening, and I am very deeply grateful, not only to Professor Barrows for his splendid paper, but also to Dr. Hinkins for having given us the opportunity of having Professor Barrows with us.

Dr. J. H. Wooley:

Mr. President, Professor Barrows and guests. The scope of the paper is so great that I am unable to even begin to discuss it. To me it is a very able presentation of the subject.

One point that Professor Barrows brought out in this fascinating, scientific paper, and which impressed me very forcibly, was the matter of the education of the individual consciousness. This education might be brought about step by step through teaching it in the public schools and in the universities.

The idea of conservation of natural resources is suggestive of the resourcefulness of mankind, and especially of the inventive genius of our people in this country, and the evolution of methods of doing things. Take the history of communication, we will say, with California. First there was the slow travel of the emigrant train; then came the pony express, then the overland stage where four wild broncos, each with a man holding his head, were hitched to the stage, and when they started off they went on a run till they came to the next relay. Then following that came the telegraph and then the railroad. But in building the Union Pacific Railroad they were limited in the matter of resources, and could not get sufficient help without paying out a great deal of money, and so what were they to do? There were the Chinese at hand to help build the railroad, the Pacific end, and so that difficulty was overcome. There is always something and some way available to meet the necessities which arise. And before the telephone was invented the man that would assert that you could talk a thousand miles to another would be scoffed at. But then came the telephone. And it was unbelievable that messages could be conveyed through the air. But the wireless came.

So I am optimistic and hopeful that we will be able to meet and provide for every great necessity that arises. But the need for conservation that Professor Barrows has called to our attention is a real need, and there should be a movement made in that direction. Yet I am hopeful that when a necessity arises some means of meeting it will be devised. For example, we have seen the evolution of the means of lighting. First we had the tallow candle, then came the krosene lamp, then gas and finally electricity. And I am hopeful that we will eventually have a substitute for the present method of producing heat. And we will have to live in hopes that such men as Professor Barrows will be able to devise such things as well as help educate the individual consciousness.

Professor Barrows:

Mr. President, may I say that I hope I did not paint a too gloomy picture. I hoped briefly to indicate in my concluding remarks, that I think the outlook is reassuring, provided we vigorously move along rational lines. Certainly one of the things which conservation should try to do is to develop new resources or to make little-used resources of larger significance. In this connection one at once thinks of what already is happening in the case of aluminum. Back in 1883 only eighty-three pounds of aluminum were produced in the United States—it was little more than a laboratory curiosity; in 1915 nearly 100,000,000 pounds were produced, and it is now being used in literally hundreds of ways. I suspect that we may all live to see the beginning of what future historians will term the "Age of Aluminum." We have had our stone age and our iron age, and we may very well have an age of aluminum. Aluminum is the most abundant of the metals in the earth's crust, and so conservative an agency as the United States Geological Survey has said that we seem to be upon the eve of discoveries and developments which will make it possible to get aluminum on a commercial scale from ordinary clay. Now if that time comes, aluminum will become at once a major metal. For after all the things of greatest utility are not the rare things, but the abundant things; not the expensive things, but the cheap things; the abundant, cheap things that can be put to a great variety of important uses.

But the fact that things little used in the past or little used now may become of large importance in the future constitutes in itself no warrant for the waste of the other things, to my mind.

Dr. J. Sydney Knowles:

Mr. President, Professor Barrows and members. Two or three thoughts came up to my mind regarding this very large subject. One of the things that impressed me particularly was that this problem which this man is working on is a good deal, as I have pictured it myself, like the large concern in business, or a municipality which will make out a budget; in other words knowing what they have to work with and seeing how far they can go with it. I think we are all in accord that that is the good, sane business way of doing. The scientific man has estimated within certain limits the resources of this country or of the world.

I am very much impressed with the paper. It is something entirely different from anything I have ever heard, and I am simply overwhelmed with the size of the subject. But one thought has run through my mind and has appealed to me very much, and that is the idea of anticipating the day—it may be a long way off—when we shall be without those things which we now have and depend upon. But the man in life looks forward to the day when he will need to have something to fall back on, and prepares for it. And it should be just as practical for a nation, for the people of that nation, to look forward to the time when they may be without those things they now have. It is true that in the meantime inventive genius will come along and show us ways of lightening the burden and lessening the drain, as it were, on these different resources so that we may put that day farther off.

Dr. Johnson made the comment that this paper would not only reach our little circle, but would reach a very much larger one, and that made me think of the remark that Professor Barrows made, that he thought it would be a very fine thing for the newspapers to have scientific men engaged to cull out the unscientific things in articles that are brought to them, before they are published. We all read nearly every day some statement in the paper of surgical procedure, which statement certainly has never been censored by a learned man; things that have been thrown out to the public indiscriminately, and every one of us has been confronted with people who say "What about this man who is growing new organs," or "this man that is transplanting organs," and all sorts of things which give people a wrong impression, and I am of the opinion that it would be a good thing to have these things looked over by a scientific man before they are printed.

The subject which Professor Barrows has presented is a very important one, and as the result of its presentation in this circle, it is going to reach many people through our literature, and they will have the subject presented to them in a scientific way and in a way in which it has never been presented to them before.

Dr. Frank Gardiner:

I have enjoyed this paper very much and appreciate it perhaps more now than I would when I was in the profession, for I have had more to do with it in connection with steam engines, boilers, drying plants, hydraulic dredges, etc. A stationary engineer and I were watching the exhaust steam coming from the Tribune Building the other day and he said, "If you could devise some method whereby that exhaust steam could be utilized, when it has run the dynamos, elevators, etc., in the building, it would mean a great saving. There is a considerable amount of energy going to waste there." If that could be utilized it would be a conservation of resources to that extent.

I am glad to be with the Odontological Society again. It is a great pleasure for me to meet my old friends.

About twenty years ago a friend of mine read a poem to me, which was never printed, and I thought I would read it to you tonight:

"Make new friends, but keep the old
These are silver—those are gold.
New-made friendships like new wine,
Aged, mellow and refined.

"Friendship that has stood the test
Of time and trouble is the best.
Brow may wrinkle and grow grey
Friendship does not know decay.

"So midst friends tried and true,
Let us now our fight renew.
Make new friends, but keep the old,
These are silver—those are gold." (Applause.)

President Roach:

Professor Barrows, like the other members I feel wholly incompetent to discuss your paper, but I am very glad of the opportunity to voice my appreciation along with theirs, of this comprehensive, interesting and instructive essay. I have been a conservationist, I think, all of my life in spirit; I have talked conservation a good deal in our own little limited field about certain things, and it has been my disposition all through life to avoid waste. It really pains me to see things wasted. I don't like penury or stinginess or anything of that kind, but to see things just indiscriminately wasted is really painful to me, and for that reason I am very much in accord with the spirit of the paper. It is a paper that ought to be of great value to us individually and to our profession and to the public at large when they have the opportunity of reading it. We are a small organization, but we try not to confine ourselves to discussion of dental subjects. We have had a good many men here who have addressed us on subjects entirely outside of the field of dentistry, and we have enjoyed hearing them, but personally I don't remember since my association with this organization, that we have had a paper, outside of our own professional papers, that has been so strikingly interesting to me as this paper has, and I assure you, Professor Barrows, I appreciate very much your coming and giving of your valuable time to entertain us as you have this evening.

Professor Barrows:

I am deeply grateful for your kind words, I assure you.

Dr. Ames:

May I ask Professor Barrows a question which I believe would interest all of you: What are considered the possibilities in our own country of recovering nitrogen from the air by means of water power, which otherwise would go to waste, which method, I understand is being utilized to a great extent in the Scandinavian countries?

Professor Barrows:

There are a number of processes for the fixation of atmospheric nitrogen that have reached the stage of commercial success—I presume as many as five or six—and there are a few nitrogen-fixation plants in this country. The developments in Europe before the war, as you imply, were chiefly in Scandinavia and in Germany, and since the beginning of the war there doubtless have been rapid developments in several other countries. But for this industry Germany must have lost the war long ago, since of course she could not get Chilean nitrates. What has been done in Europe can be done and should at once be done in this country. Water power development here is in an unfortunate state pending legislation by Congress which will, so to speak, release the water powers under Federal control, for legitimate development. Repeatedly bills have been introduced in Congress designed to bring that about, and you have noticed that in his recent statement to the public the President deplored the failure of Congress to act in the matter.

DR. AMES:

I would like to ask whether in the Cascade region, for instance in Canada, which is similar to conditions in Scandinavian countries, there is a permanency of streams furnishing water power, and whether there is a reason why they should not be developed?

PROFESSOR BARROWS:

No, there is no economic reason why many power sites should not be developed in the Cascade Mountains, both in Canada and in the States. The Pacific Northwest has approximately one-third of the total water power of the United States on the "minimum" basis. On that basis we have about thirty-seven million horse power in the United States, of which the Pacific Northwest has about one-third. The high mountains near the coast rob the prevailing westerly winds of much moisture, which is precipitated in the form of rain and snow on the upper slopes, and that great amount of water descends a great distance in a few miles, since the mountains are near the coast, developing, of course, great water power possibilities. Some of those mountains have glaciers, and many of them have glacial lakes, both serving to regulate the flow of the issuing streams. The forest cover, with its attendant mulch, also serves as a great sponge to decrease the immediate run-off, and to increase the later seepage run-off. So that we have there a great amount of water in streams of relatively uniform flow, which water descends a great distance vertically in a few miles; in other words, all the requisites for water-power development are met there in a peculiar degree.

DR. AMES:

Does that hold good on our side of the line?

PROFESSOR BARROWS:

On both sides. When I said the Pacific Northwest has one-third of the minimum power of the country I meant Washington, Oregon, Northern California, and the Idaho district. They have enormous quantities also in Canada.

DR. S. SYDNEY KNOWLES:

When you refer to conservation of forest resources do you mean the setting out of trees, or things of that kind?

PROFESSOR BARROWS:

The conservation of forest resources involves a good many things. It involves scientific logging, reforms in milling and manufacturing, fire-protection, reforms in taxation, increasing the productivness of existing forests, maintaining forests on critical areas for their protective value, quite as much if not more than for their timber; it means re-forestation and forestations, the planting of trees in some cases on non-agricultural land that may not have been forested originally; it means the utilization, as far as practical, of many things from the forests heretofore wasted; it means combating insect pests and the diseases of trees; it means the preservative treatment of much timber—ties, posts, poles, etc.—with a view to increasing the period of its service; it means the improvement of farmers' wood-lots. These topics do not exhaust the list of things involved in forest conservation, but they may be suggestive of the scope of the latter.

CHICAGO DENTAL SOCIETY.

Regular meeting held at the University Building, Chicago, Illinois, Tuesday, February 20, 1917, at 7:45 P. M.

Dr. George C. Poundstone presiding.

The following papers were read: "The Main Value of the Radiograph in Dentistry," Dr. Hollis E. Potter; "Incorrect Interpretation of the Dental Radiograph," Dr. Floyd E. Leach; "The Correct Interpretation of the Dental Radiograph," Dr. F. F. Molt; "Limitations of the Value of the Radiograph," Dr. Ralston Lewis.

DISCUSSION.

DR. C. N. JOHNSON:

Mr. President, ladies and gentlemen. I came here tonight with the sole object of listening, and not to say anything. But I feel that I must express my great appreciation to the essayists of the evening, not only for the scientific value of the work they have given us, but for their mental attitude towards this particular subject. I feel that we are especially indebted to Dr. Potter, who is not a member of our society, for coming here and throwing light upon this subject that is so important to all of us.

I also want to compliment the essayists on the conservative treatment they have given this subject. I venture the assertion, that if we had had a similar lot of papers a year or two years ago upon this subject there would have been less conservatism in the mental attitude of the essayists, and I believe it is a healthy sign of the times when we get the point of view of men who have been working in this field as these men have, and when they are willing to come out frankly and honestly and tell us that the X-ray has limitations.

When the X-ray was first used we were given the impression—and it was probably an honest impression from the point of view of those who were making X-rays—that it was infallible. Now we have been shown tonight by experts in this work that it is not infallible in the interpretation that we are able to give it. I have been more pleased tonight with what we have been shown as to the precautions that must be taken in forming opinions on X-ray evidence than I have been with any similar lot of papers that have ever been presented to the profession.

Now, Mr. President, I think we can all go home tonight feeling *not* that the X-ray is not valuable,—for I don't know what we would do without the X-ray in practice; we must use it every week and sometimes every day,—but I believe that the X-ray to us is going to be more valuable in the future than it has been in the past. It is going to be valuable if we take it from the point of view of these experts in the work, because it will show us its limitations, and we will not be making the mistakes in the future that we have in the past.

I want to emphasive one thing that has already been brought out tonight. I have had the greatest admiration for the X-ray man. He has been able to do many things that I never could have done. He has aided me in my work, and the X-ray has been a benefit to me. But the thing that I have resented all along, and which has been referred to tonight, is the fact that the X-ray man in some instances will write a diagnosis on the evidence that he gets from the picture, and hand that diagnosis to the patient, and I think that is a cruel wrong, not only to the practitioner, which is not such a serious thing, but to the patient, which may be a very serious thing.

I do not believe the X-ray men are going to do that so much in the future as they have in the past. Possibly they are not to blame for having done it. We should have called their attention earlier to the fact that there was a possible error in that kind of a procedure. We want to have, as Dr. Molt has said, and as Dr. Lewis has said, and which has been referred to in the other papers, the closest co-operation and consulation between the practitioner—whether he be a practitioner of medicine or dentistry—and the X-ray man. Each one can throw light on the other's point of view. We can get very much benefit from the interpretation of the X-ray man. We want all the consultation we can get between the practitioner and the X-ray man.

But, as Dr. Lewis has said, I do not believe the patient should be told anything about the findings in the X-ray. If X-rays were always infallible there might be justification for it, but in too many instances false ideas have been instilled in the minds of the patients. That magic word "infection" has been written on cards accompanying X-ray pictures, and that is a terrible word to the patient today, and it is leaving an impression that no amount of argument afterwards can eliminate. And that is a wrong. That is the thing that I have been opposing all the time. And I want also to say that it is difficult for the most expert X-ray man to tell whether a shadow at the end of the root of a tooth is an infection or not.

DR. A. D. BLACK:

Mr. Chairman, I had no thought of discussing these papers, and I am not going to do so, because I do not believe I could add anything of value to the very splendid presentations. I do want to recite this one little thing that happened to me today as a mistake that might occur in the use of the X-ray. A boy of fourteen was sent to me to have two supernumerary teeth to the lingual of the upper incisors removed, and he had a radiograph, which showed the crowns of the two teeth with just the least little bit of the roots formed. I asked him how old he was, for I thought it was queer that a boy of the age of fourteen should have those two teeth, even though they were supernumerary teeth, with so little of roots formed, and I afterwards questioned the boy's mother and found that the X-ray picture had been made four years ago. When I removed those two teeth, they had fully developed roots about five-eighths of an inch long. Instead of being very easy to extract, it was necessary to cut away quite a little of the adjacent bone.

THE PRESIDENT:

We have heard from the dental side on this question and now we would like to hear from Dr. Shanklin of South Bend, who is a physician interested in radiographic technic.

DR. R. C. SHANKLIN:

Mr. President, ladies and gentlemen. I assure you that I had no idea of addressing this meeting tonight. We have listened to a very excellent symposium on dental radiography, the main points emphasized being the importance of the radiograph in diagnosis of dental pathology; the many errors that may occur in the interpretation of the plates; but above all, such papers as we have had tonight, emphasize the need of cooperation between the oral surgeon, the radiographer and the general practitioner. The conservatism expressed in these papers is certainly very gratifying because we are prone to overestimate the importance of the Roentgenological findings and frequently the result of dental surgery based upon these findings is not all that is expected.

DR. E. D. COOLIDGE:

Mr. President, and members of the Society. I have enjoyed listening to these papers tonight, and like those who have preceded me in discussing them, I wish to say I am very much impressed with the conservatism of these men. I am sure that will be of great benefit to all of us. No doubt there have been a great many mistakes made, and we have seen such things as Dr. Johnson reported, and I am sure it has been a cause for regret to us all that such things have occurred. I do not think that a careful, conscientious man will make many such mistakes, but after tonight there will be less such mistakes made by those who have heard these papers than have been made before.

There are so many things which enter into reading these radiographs that I agree with Dr. Lewis in that an interpretation made based upon a clinical diagnosis as well as a diagnosis purely from the picture is much safer, although I do not mean to say that the men who are not doing this are making mistakes. I do not mean to insinuate that at all. But in my own experience I never interpret a radiograph without knowing something of the clinical condition of the patient.

I tried to cure, once only, the shadow that was made by the reflection of one of those foramina in the process, and I only found it by getting several radiographs of the same tooth.

This is a good argument, I believe, in favor of each man having his own machine: He will be apt to take more pictures than he would make if he were sending his patients where each picture meant an additional expense to that patient.

I think the radiograph is doing us a wonderful amount of good, and we could not possibly be without it, in spite of all of the mistakes that may be attributed to it. I am grateful for the conservatism that has kept us from making greater mistakes, and I know that in the future even greater benefit will be derived from the cooperation of the radiographers and the practitioners than have been drived in the past. Thank you.

Dr. H. E. Potter:

I just want to take one minute to apologize for some things that I have done. I thought it probably would be a good idea to make a little closing statement which might explain to the dental public something concerning the criticism which has been made of men who are not in the dental profession having gone beyond their real scope. Now I have been in the midst of this work on focal infection since it began. A great deal of work has been done at the Presbyterian Hospital and in connection with research work of Dr. Billings and others, and I have had to stand the brunt of a good deal of criticism, and I want you all to understand that it has been whole-hearted and honest work. For instance, there are some eye men who know that 85 per cent of cases of iritis have usually been attributed to syphilitic infection, and perhaps ten per cent to some other infections, and in five per cent of the cases they do not know what it was, and have come to believe that a good deal of it was due to some milder infection, that some came from sinuses and teeth, and several oculists in this town decided to send all of their cases of iritis to one or two general clinicians for study, during which study lots of sinus X-rays were made and lots of dental X-rays were made. This was in the form of research work. They were going to study one hundred or one hundred and fifty cases and follow them up. They made all kinds of sacrifices of time to study them thoroughly from every standpoint. Now if I were a dentist and a doctor and a clinician came to me and told me that I had abscessed teeth when I was morally certain that I had a very questionable type of infection around the teeth, I would think they were going beyond their scope, so to speak. But in research work of this sort you have got to thrash out every point. Inasmuch as the research often has to be done on people as they come, you have to stimulate them to every effort to help you clean up and eliminate these things, and then get your answer as time goes on. Now some of the work that has been done has been entirely from a research standpoint, and it has been done at a sacrifice of a great deal of time and effort, and if it struck any one that we had gone farther than we should have, it must be remembered that this work was done mostly as scientific research and for the sake of developing this science. I was "kicked" in to make X-rays of teeth practically for that purpose, and I think in view of the fact that the dental public is so well educated and well informed on the various phases of this subject, I should very much like to withdraw from that part of the work, and if I do continue doing any of it, I am sure that from now on all I shall make in the way of report to a doctor who has referred the case to me, and is searching for any possible infection, will be to make a note that the dentist's attention ought to be drawn to the condition of certain named teeth. I am very sure that that is the only kind of a report I shall ever make again, because in view of the fact that the dental public has had this matter called to their attention as strongly as they now have, they should be the ones to decide absolutely and take the responsibility of handling these cases.

Furthermore I think I shall call the attention of the X-ray societies to which I belong to this, that such methods of procedure should be adopted out of respect to the dental profession, which now we can assume should have the moral conscience to deal with it in exactly the way they think it should be dealt with. (Applause)

Dr. Floyd D. Leach:

There is nothing further I wish to say, only to leave this one thought with the dentists, that as much conservatism as possible in each individual case should be used. Going into the cases from a clinical as well as a radiographic point of view is the only way to get to the bottom of the case. Snap judgment in reading radiographs and reading at long distance will never get us to a standpoint of uniformity in this work.

Dr. Ralston Lewis:

In closing I wish to apologize to Dr. Potter. I never knew that Dr. Potter made a diagnosis before, but I wish to say that you cannot find a better X-ray man than he in the city of Chicago. He has been at it so long and done so much research work in this connection that I want to publicly apologize to him for bringing this matter up in the way I did.

And in conclusion I wish to venture the hope that we will all co-operate in this work, and then the X-ray will be of real and lasting benefit to every one.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

DO YOUR BIT.

There are at least 40,000 dentists in the United States, and every one of them is needed in some capacity to assist the government at this time. There are almost as many ways of helping as there are individuals. It is not always a matter of going into the trenches to be of the greatest assistance in modern warfare. Many of our members for various reasons will not be eligible for the fighting line, but every one can do something to help. Suppose, for instance, that each one of the 40,000 should volunteer to put the mouth of one soldier or sailor in condition for service in accordance with the splendid plan of the Preparedness League. See what an aggregate of good would come from that single small act. The mere suggestion of this way of helping was an inspiration on the part of Dr. J. W. Beach of Buffalo, and the thanks of the profession and the governmental authorities are due him.

But so far as the individual dentist is concerned this amount of service is so small that he can well afford to do much more than this. Each man must look about his immediate environment and see in what way he can best serve the country. If he is so situated that he cannot prepare soldiers or sailors for the front he can contribute to Red Cross or other patriotic funds. He can buy government bonds, he can support organizations which have for their object the alleviation of suffering among the contestants. He can help to conserve the resources of the country. He can do as one dentist out west has done—plant potatoes on all his available land and loan money to farmers in his vicinity who had none to buy seed. Every one can foster agriculture in some way, and agriculture will be needed.

The help of the dentist should not be half-hearted or negative—it should be whole-hearted and positive. This is a day of self-sacrifice and every one must "do his hit."

Sacrifice is the essence of all that goes to build character, whether in a people or in an individual, and there never was so great an opportunity as now for selfsacrifice. Growth comes chiefly from doing for others with an unselfish motive and in this light the present period is surely the growing time of the nations.

Our profession is being placed on trial as it seldom has been before. The significance of dental service was never so apparent to the military and naval authorities as it is now. The demand for dental surgeons who are competent is very great in both arms of the service, and there must be no flinching either in the proper preparation for this work or in its practical performance when the time comes. To be a dentist in these times is to accept responsibility and assume service. Let each individual look about and see in what capacity he can best serve his country, and when he has found this let him manfully and cheerfully "do his bit."

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. VI.

My Dear Boy:

Are you tired? If I thought you were, I would not write another line. I have a sly suspicion that you are saying to yourself: "This man is telling me nothing that I do not already know." Even so; I once heard literature defined as the faculty of expressing the thoughts of others in a more lucid manner than others could express them themselves. Not that I set myself up as a literary man, and not that I think I can express your thoughts better than you can; but mayhap I can formulate your thoughts for you and present them in a little different light. And this is my sole purpose in writing. For instance, you have probably gathered some ideas as to what is involved in the phrase "professional duty." Let me amplify. Professional duty consists in something more than filling teeth well, and charging a proper fee for it. It does not mean merely the making of crowns or bridges, or doing any other practical work. It is important that you shall be able to do these things in a creditable —even in a skillful manner. But you must do more than this. You must do the very difficult thing of always being a gentleman. By being a gentleman I do not mean that you shall dress well, keep yourself clean, have polished manners and let it go at that. To be a gentleman you must be all that the word implies, and in professional life more besides. You must not only be gentle but you must at times be firm. And firmness does not mean stubbornness. Neither does it mean that you must bend everybody else to your will. It means that you must frequently control your own will, and conquer your own impulses. And it also means that you must not permit a patient to override your convictions when you know you are in the right. I have said that patients have whims, and to be a gentleman you must humor those whims—but only up to a certain point. If you find that the whims of the patient are merely subjecting you to a little inconvenience, then you must smile and acquiesce, but if you believe that they are likely to bring harm to the patient then you must oppose them with the utmost firmness. This is being a gentleman, and it is practicing professional ethics.

To be a gentleman you must be kind and I sometimes think that kindness is the keynote of success in life more than any other one thing. Kindness, my boy, is the best investment you can make. It is better than bonds, or stocks, or first mortgages. It enriches life, and does not deplete the purse. It brings dividends hourly instead of semi-annually, and pays compound interest. It is a cumulative investment increasing automatically, and never expiring. Kindness kills contention and forces victory from defeat, it makes you master without the wish to rule. It wins battles without fighting, and compels obedience without fear. It builds up but does not tear down, it constructs but does not destroy. It weaves the gentle warp of harmony with the woof of happiness, and makes a fabric which will stand the test of time. Wear this fabric constantly about you, My Boy, and you will have gone a long way toward being a gentleman.

Professional duty also means faithfulness. I have already reminded you that there was placed upon you a peculiar obligation when you became a professional man, and one of the chief tenets in the creed of a professional man is faithfulness. Never consult your own comfort when it comes to the discharge of your professional obligations. You did not choose dentistry for comfort, or if you did you "hit the wrong trail." Faithfulness means getting up in the middle of the night willingly, cheerfully, to relieve a fellow being of pain. It means remaining in your office at times longer than you desire, to complete a case for which the patient may be waiting at some inconvenience. It means concentrating your energy to take care of an emergency which may pounce upon you in the midst of your routine duties, and for which you were unable to make calculation. Ah, My Boy, the emergencies of profesional practice constitute the greatest hardship a man encounters. They are the prod which keeps him stirred up and uncomfortable, the goad which lashes him unmercifully in the midst of a busy day. But they must be accepted with good grace, and as a part of the inevitable. No one is to be blamed for them, and no one can avoid them. The patient cannot help the fact that there was a small pebble in the vegetable, or a bit of bone in the meat which broke his tooth and made it pain. And surely if you are a true professional man pledged to do your duty you will not expect him to wait and suffer the pain till it suits your convenience to see him. You will make room for him among your appointments by extra effort on your part—of course you will. This is faithfulness, and without it you are unworthy the name of a dentist.

Faithfulness is the hand-maiden of self-sacrifice, and self-sacrifice is the highest attribute of human nature. Be thankful that in your professinoal life you are compelled to practice much self-sacrifice, because in this lies the greatest development of character. It is the inspiration and glory of the professions that they present so many opportunities for the exhibition of self-sacrifice; and that the sentiment developed around professional life has made it incumment upon a man that he shall willingly at all times sacrifice his own comfort and convenience—even if necessary his own life—for the welfare of his fellowman. This adds a sublimity to professional life, and places upon those who practice a profession one of the most sacred obligations of human experience. Try to realize this, My Boy, in its fullest sense.

Sincerely your friend,

C. N. J.

BOOK REVIEWS.

HOW TO RUN AN AUTOMOBILE.

By Victor W. Page, M. S. A. E., author of "Automobile Repairing Made Easy." Seventy-two engravings, 178 pages. Price $1.00. Published by The Norman W. Henley Publishing Co., New York.

This is a most practical little book, well worth the money to anyone who owns or runs an automobile. It is filled with common sense advice as to the care and manipulation of an autmobile, and so worded that anyone can follow instructions.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Repair a Broken Facing:—If a facing breaks on a bridge do not remove the bridge but build a new facing with synthetic porcelain.—*James W. Cormany, Mount Carroll, Ill.*

To Pass Strip Through a Tight Contact:—When it is difficult to pass a finishing strip into the interproximal space on account of a tight contact point, sometimes it can be done by first passing a ligature to the tightest point. Then pass the strip down against it and carry both ligature and strip through.—*J. F. Nelson, Chicago, Ill.*

Dental Bridges:—One of two rules should be observed in constructing a dental bridge. Either swage a saddle and burnish it firmly to fully settled gum to prevent the lodgment of food under it, or bridge in vacant spaces between the anchorages with little more than cusps, leaving an open free space between the bridge and the gum, which can so easily be kept clean, resulting in perfectly healthy gums. Either of these methods will be found to be sanitary.—*H. A. Cross, Chicago, Ill.*

Painless Devitalizing Paste:—Take arsenious acid, ground fine, 1¼ grams, powdered cocain hydrochlorate 2½ grams, camphophenique liquid to make a creamy paste. When applied on a very *small* clean pledget of cotton and sealed with temporary cement in a dry cavity for 48 hours invariably the tooth pulp will be devitalized. If any sensitiveness should by chance remain in the pulp a second application of 24 hours is indicated. I have had excellent and painless success with this preparation for fifteen years.—*Burton Lee Thorpe, St. Louis, Mo.*

CORRESPONDENCE.

LETTER FROM DR. NOEL.

Nashville, Tenn., May 14, 1917.

TO THE EDITOR OF THE DENTAL REVIEW:

Your correspondent has been so well pleased with the editorials that have appeared recently in your journal that he wishes to beg a little space for the expression of his approval.

Feeling that you have taken the defensive in behalf of the entire dental profession against the very unjust accusations that are daily being made by the overzealous followers of writers like Dr. William Hunter, he would utter a word of commendation and thanks in behalf of the ethical practitioners of dentistry.

The finite mind is prone to magnify every new thing that is discovered, and often to mistake mere theory and speculation for facts.

The universal urge toward advancement is so great that new ideas are seized and overworked until disaster compels a halt. This has probably been exemplified in the history of all professions, and the efforts of reformers have made progress in many cases much like the climbing of the fabled frog in the well.

The medical world has been so avid for the new that it has become axiomatic that "doctors are the greatest fadists on earth." You have most truthfully pointed out the vain efforts through many years of the dental profession to make their medical brethren see what had long been apparent to them—namely, the baneful effects upon the general health emanating from diseased teeth and their environment.

It was not anticipated by the writers who labored so unceasingly to teach this truth, that when once accepted as now, in the light of bacteriology and pathohistology it must be, it would be so overworked as to cause the destruction of millions of teeth that could be saved, and the undoing of years of patient toil and teaching in the field of dental pathology and therapeutics.

In the writer's limited field of vision, the spread of this fear of infection in the mouth from pulpless teeth crowns and bridges, from calcarious deposits on the teeth, and points of suppuration, has become such an obsession with many medical men and a few dentists that the practice of dentistry has undergone a complete change.

It is now almost impossible to persuade a patient to have a piece of fixed bridge work constructed, even under the most favorable conditions, and some have become so suspicious that they doubt the ability—especially of the old and experienced operators—to remove the pulp and properly fill the roots of a tooth. We have gone back in some things fifty years, and in other things one hundred years.

Have we not returned to the forceps and to vulcanite to a disgraceful extent? Operative dentistry was never during this writer's lifetime at so low an ebb as he sees it around him today. The almost complete abandonment of the gold foil filling for the gold inlay is much to be deplored, and is causing many, many alveolar abscesses because of the extensive cutting for anchorage endangering the vitality of teeth.

Far be it from me to disparage these very great improvements! The introduction of the gold inlay should be a very great advance step for dentistry; it is a very valuable, a very superior method in *some* instances, but its original inventors had no idea that it would ever take the place of the gold foil filling. I would hesitate to say in plain English what I think of those operators who inlay all occlusal cavities, and some in my own city do this when gold is the material of choice.

I desire especially to back you up, Mr. Editor, in all you have said in your editorials about the X-ray. That this method of photographing the deep structures is very valuable in diagnosis, *is* a wonderful improvement and almost indispensable in modern practice, none can gainsay. I have one of the latest X-ray machines in my office, and find it daily helpful, yet I believe the radiograph is often grossly misinterpreted, and that many good teeth are being sacrificed because of the misunderstanding of these pictures. Many pulpless teeth showing slight cloudy areas in the spongy bone surrounding the root points are being extracted by the orders of the family doctor, when every old experienced dentist knows they would get well if the pulp chambers and root canals were properly opened, sterilized, and filled. Many dentists seem to have lost their nerve about treating septic teeth, and are yielding them up to the forceps without a struggle. Either they fear their patients may die suddenly of heart disease helped off to the other world by their mistaken zeal to save teeth,, or that necrosis of bone may occur about the roots of such teeth, or that a suit may be brought against them for malpractice, etc. I verily believe I have professional friends who are losing sleep and flesh thinking of the lives they may have sacrificed during all the years of their practice trying to retain diseased teeth in the mouths of their patients. To such I would say: Be of good cheer, Brother, doubtless you have always faithfully endeavored to discharge your duty as well as you could. Remember that patients have to die some day anyhow, and in those cases over which you are worrying the chances are about even between the blunders of the many physicians and specialists who were doing for them. Do you not underestimate the *vis medicatrix naturae*, oh, my anxious brother! Have you not observed roots denuded and teeth exfoliated by natural processes, the patient all the while maintaining good health? In offering this consolation to those who have nervous rigors in the light of X-ray revelations, I would not be misunderstood as condoning careless and ignorant dentistry; on the contrary, I would urge all to use these modern appliances as far as available, and redouble their efforts to safeguard their patients, but what will it avail to worry over the probable mistakes of the past? Lest someone should misunderstand me and think me one of those old fossils with no knowledge of nor faith in modern bacteriology and pathology, I want to say I place the highest estimate on the findings and teachings of such men as Rosenow, Billings, Mayo, and others. I believe in focal infection; have read some original papers on this subject where I thought they would do good, but I think some men have a kind of bacteriophobia, if I may coin a word to describe this mania, and I would quiet their fears, at the same time urging all aseptic caution; use the X-ray and every modern appliance calculated to improve work and bring good results, but remember nature can take care of many of our shortcomings.

Surely every busy practitioner has done much poor work, and those supermen who are saying, "Any man who would turn out such work as that ought to be sued for malpractice," may find that "chickens come home to roost."

Oh! thank you, Mr. Editor, for that editorial on "reaping the whirlwind." It is not wise to suggest the idea of suits to patients. We shall do well to attend to our own business, and not become advance agents for shyster lawyers.

No doubt many of the suits that are being brought against dentists are suggested to the plaintiffs by the remarks of overcritical dentists. We should be guarded in our language in discussing the work that others have done for our patients, remembering the spirit of the code of ethics as well as the letter.

No doubt many worthy practitioners are losing patients, and in some cases, whole families at a time, because of the criticism of some of our heedless overzealous X-ray men. These are not always dentists; some are specialists, some physicians, and some only assistants in medical offices. They are called on to take a picture of the teeth of your patient or mine; the conditions revealed may be bad, it may be from lack of care and cleanliness on the part of the patient as much as from bad work—but the patient sees the picture and is told that he has had "a very rotten lot of dentistry done"—it may even be suggested that he is entitled to "damages." Can you blame that patient for seeking legal advice, or at the very least seeking another dentist, while entertaining feelings of resentment against his old dentist?

Contemporaneous with the X-ray critics have sprung up a number of root canal specialists—or, lest I fail to designate the men to whom I refer—let me say, men claiming great excellence for their root canal work, but assuming a very critical attitude toward such work as executed by others.

These men have so magnified the difficulties of the usually simple operation of pulp removal and root canal filling, and have said so much about the disastrous consequences of imperfect root canal fillings that some of our more modest craftsmen wonder if they ever properly performed one of these root operations, and hesitate to attempt another. One of these men in a discussion on root work at a recent meeting was quoted as saying, that after removing with barbed broaches every bit of pulp tissue, the apical foramen should be enlarged with reamers, and these reamers should be passed entirely through into the soft tissue of the apical space. Think of the danger of infection—I may say the *certainty* of infection—by this needless invasion of the apical membrane, and think of the weeping of blood and serum into the canal, rendering root filling almost impossible! A punctured root could not be worse.

Men who have been filling roots successfully in most of the normally formed teeth, whose work has withstood the test of time, have usually been content to get out all the pulp that could be removed, leaving the foramenina through the apical cementum as natural and undisturbed as possible. When these are multiple or delta like, the introduction of a gutta percha filling saturated with aristol, will take care of the root and maintain asepsis.

Excuse the old men like Dr. Edmund Noyes and your correspondent for refusing to be perturbed by these mystery makers.

I would like to give a method of root canal filling that has been very satisfactory in my practice in cases where conditions were normal, but I have already put in so many words that I fear you will have to decline to publish this. If you think your readers would care for my method of filling root canals, I shall be pleased to write of it at another time.

Yours fraternally, L. G. NOEL.

(The editor feels that his readers would be glad indeed to have Dr. Noel describe his method of filling roots.)

MEMORANDA.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

Date of the South Dakota State Board of Dental Examiners changed to June 4, 1917. Robert Jasmann, secretary, Scotland, S. D.

PENNSYLVANIA STATE DENTAL SOCIETY.

The forty-ninth annual meeting of the Pennsylvania State Dental Society will be held in Philadelphia, June 26, 27 and 28, 1917, at the Bellevue-Stratford Hotel. J. F. Biddle, Secretary, Pittsburgh, Pa.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, June 18th to 23rd, inclusive. For application blanks and full particulars address Dr. Fred J. Prow, Bloomington, Indiana.

AMERICAN SOCIETY OF ORTHODONTISTS.

The annual meeting of the American Society of Orthodontists will be held at Excelsior Springs, Mo. (30-minute ride from Kansas City), September 5, 6, 7 and 8, 1917. The program will be one of the best ever presented by the Society. All those interested in orthodontia are invited to attend.

CONNECTICUT STATE DENTAL COMMISSION.

The Connecticut Dental Commission will meet in Hartford, June 28, 29 and 30, 1917, to examine applicants for license to practice dentistry, and for the purpose of transacting any other business proper to come before it. For the necessary blanks, address Edward Eberle, Recorder, 902 Main St., Hartford, Conn.

TENNESSEE!!

Don't forget the Golden Jubilee of the Tennessee State Dental Association at Memphis, June 19-22, 1917. Everything is all ready with a good program, and the heartiest welcome which the South can give. The President, Dr. D. M. Cattell, with his splendid band of workers, will extend the right hand. Don't fail them.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners will be held in the City of Ann Arbor, in the Dental Building of the Dental Department of the University of Michigan, June 18th to 23rd, both inclusive. This meeting will be held for the purpose of offering an examination to all eligible candidates who wish to apply for a license to practice dentistry in the state of Michigan. All candidates must furnish the secretary with application and fee not later than ten days prior to examination. Applications and all other information may be obtained by addressing the Secretary-Treasurer, E. O. Gillespie, Stephenson, Mich.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN, 140 THE FENWAY, BOSTON, MASS.

UNDERGRADUATE ASSISTANTS.

During the months of June, July, August and September an opportunity is offered by the Trustees of the Forsyth Dental Infirmary for Children to a limited number of senior undergraduate students to act as assistants in the clinics of the infirmary. This privilege permits a student to obtain unusual clinical advantages in the various departments of the institution where operative dentistry, orthodontia, nose and throat, oral surgery, radiography, pathological diagnosis and research work are continually carried on. Operators' gowns and all instruments are furnished. Over four hundred children are treated daily. For further details apply before May 15th to the director, Dr. Harold DeW. Cross, 140 The Fenway, Boston.

NATIONAL DENTAL ASSOCIATION—RAILROAD RATES TO THE TWENTY-FIRST ANNUAL SESSIONS OF THE NATIONAL DENTAL ASSOCIATION, NEW YORK CITY, OCTOBER 22-26, 1917.

The Trunk Lines, New England and Central Passenger Associations, have granted a rate of two cents per mile in each direction, going and returning via the same route only, limited to midnight of October 30th.

Going tickets in Trunk Line territory will be on sale October 19th, 20th, 21st, at the one way fares, on the certificate plan, these certificates to be endorsed by General Secretary Otto U. King and to be validated by the special agent of the railroads who will be in attendance on October 24th, 25th, 26th. Return tickets to be sold on presentation of validated certificates October 24th to 29th at the difference between the fares paid on the going trip and the fares for the round trip. Return limited to continuous passage to destination and not later than October 30th. This applies on tickets with a minimum of $1.00 for round trip.

New England Passenger Association tickets to be sold or certificates issued and good going October 19th, 20th and 21st and returning not later than October 30th, two cents per mile each direction, shore line mileage, going and returning via the same route only.

Central Passenger Association territory round trip tickets requiring validation at New York City will be sold on October 19th, 20th and 21st with a final return on October 30th, two cents per mile in each direction.

There will be no fee for validation.

Committee of Transportation,
D. C. Bacon, Chairman, Chicago, Ill.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN, 140 THE FENWAY, BOSTON.

PERMANENT STAFF APPOINTMENTS.

A competitive examination of graduates in dentistry (of less than three years standing) for appointments to positions on the permanent staff for full and one-half time service will be held early in June at the infirmary.

Appointments will be made for one or two years as follows:

Full time service requiring operating five and one-half days a week at a salary of $1,000 a year.

One-half time service requiring operating six half days a weeks, either forenoon or afternoon, at a salary of $400 a year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry and to "qualifying" in the practical work of the clinics during one month's trial.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry from different parts of the world in addition to the numerous regular clinics and lectures.

Operators after serving three months are eligible, by qualifying, for appointments in the special clinics where post-graduate work is given.

The operators on this staff have the advantage of the clinics and lectures of the Post Graduate School of Orthodontia.

The infirmary clinics provide unusual advantages in the various departments of the institution where operative dentistry, orthodontia, nose and throat and oral surgery, extracting, novocaine technic, radiography, pathological diagnosis and research work are continually carried on.

The average number of cases treated daily is more than 450 in all departments.

All material and necessary operating instruments will be furnished; up-to-date apparatus, including electric engines, sterile instrument trays, fountain cuspidors, compressed air and the modern operating room type of lavatories are available for use.

A diploma of service will be issued by the Trustees to each member of this staff who has completed this term of service in a satisfactory manner.

Applications for the above positions should be made not later than May 15th.

Information and the date of the examination will be furnished to those interested.

Harold DeW. Cross, D. M. D., Director, 140 The Fenway, Boston, Mass.

AMERICAN AMBULANCE HOSPITAL OF PARIS.

Neuilly-sur-Seine, le March 26, 1917.

Mrs. Archibald Freer,
1420 Lake Shore Drive,
Chicago, Illinois.

My Dear Mrs. Freer:

It is with great pleasure and gratitude that I have to acknowledge receipt of the two drafts amounting to Frs. 48593.62, raised at the Allied Bazaar in behalf of the Dental Section of the American Ambulance. It is most encouraging to those of us who have been working here since the beginning of the war to realize by such united effort that there is no lack of sympathy and interest among our compatriots at home, and especially in this department of surgery which has been so largely developed during this war and which, both for appearance and comfort, has brought relief and encouragement to so many of the otherwise hopelessly wounded.

In behalf of the entire staff, in grateful appreciation, I am, very truly yours,

(Signed) George B. Hayes, Chief Dental Surgeon.

Mrs. Archibald Freer,
1420 Lake Shore Drive,
Chicago, Illinois.

My Dear Mrs. Freer:

Your letter of March 8th enclosing two checks for Frs. 5113.62 and Frs. 43,480, respectively, has been received, and the Treasurer of the American Ambulance will forward to you his formal receipt in due course.

I am instructed by the Ambulance Committee to thank you most sincerely, and through you, your committee for this munificent donation to our Dental Department. It will go a long way toward the support of the numerous cases of facial injury under our care, and toward the procuring of much needed apparatus and supplies. You may assure the generous contributors to this fund that they are doing much in the relief of human suffering and especially in returning to their families presentable and self-respecting men who, without our help, might remain repulsive and discouraged members of society.

Again thanking you and your associates, I am, very sincerely yours,

(Signed) Lawrence V. Benet,
For the Ambulance Committee.

The formal receipt has been received. A further 10 per cent of surplus funds accruing to booth 16 from the Chicago Allied Bazaar of 4,838 francs, plus 800 francs, proceeds of concert dance at Blackstone, April 14th, will be forwarded immediately.

Eleanor G. Freer, Chairman.

The foregoing communications explain themselves, except that they do not sufficiently emphasize the amount of work this most gracious woman has performed on behalf of the Hospital for Dental and Facial Surgery in France. Through her own supreme effort, aided by those she has rallied about her, she already has raised $10,000. Now her great aim is to supplement this by monthly contributions to help furnish supplies. If each dentist who reads this would send her a dollar a month—even less—it would aid her greatly in carrying on her philanthropic work. A noble woman, outside the profession, has done this splendid thing for dental surgery. Cannot we in the profession show an appreciation by helping her to this small amount? Contributions may be sent to Mrs. Archibald Freer, 1420 Lake Shore Drive, Chicago, Ill.

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THE
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Vol. XXXI. CHICAGO, JULY, 1917 No. 7

THE PREVENTION OF ORAL FOCAL INFECTION.*

BY H. E. FRIESELL, B. S., D. D. S., PITTSBURGH, PA.

Focal Infection is the most interesting subject of the present time in both medicine and dentistry. The removal of the focus of infection has become the approved method of treating the systemic diseases.

The mouth is the greatest field of focal infection, according to leading authorities in the practice of medicine, and as prevention is much more important than cure, and vastly more successful, the famous statement of Dr. Charles Mayo that the next step in preventive medicine must be taken by the profession of dentistry seems to be no exaggeration, and the responsibility of dentistry for much of the health and happiness of the human race assumes serious proportions.

There are two principal avenues of infection in the mouth, through which probably 95 per cent of oral focal infections arise. They are the gingival border of the peridental membrane, where pyorrhea begins; and the apical portion of the alveolus which is the seat of the alveolar abscess which is caused by infection through the exposed root canal.

This paper will therefore treat of the location, form, structure, functions, injuries and protection of the gum tissue and gingival portion of the peridental membrane.

Dental caries as the most frequent cause of exposure and death of the pulp with subsequent alveolar abscess will be treated as to its points of beginning, periods of activity, and methods of prevention. Operative procedures or technique will not be gone into, but we will endeavor to confine the paper to a review of the principles upon which correct operative procedures must be founded.

If the bones of the jaw be examined it will be seen that the alveolar process surrounds the roots of the teeth only to a point approximately 2 to 3 millimeters from the line of junction of the cementum and enamel. This line is called the gingival line. The peridental membrane surrounds the root of the tooth, not only filling in the space between the wall of the alveolus and the root, but also extending crownwise on the root to the gingival line. In other words, all of the cementum of the root is covered by peridental membrane, but all of the cementum is not surrounded by alveolar process. The root portion of the tooth which protrudes from its socket from 2 to 3 millimeters, in the opinion of the essayist, should be designated as the neck of the tooth.

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*Read before the Chicago Dental Society, March 20, 1917.

Covering the alveolar processes, investing the necks of the teeth, and extending around a considerable portion of the enamel covered crown, is found a dense mat of connective tissue, containing many white fibres and forming a firm membranous mass, which is continuous with the deeper lying periosteum on the outer sides of the alveolar process, is firmly attached to the peridental membrane at the necks of the teeth, and has its unattached or free margin extending occlusally for some distance beyond the gingival line, hugging the enamel of the tooth tightly, but having no attachment thereto. This tissue is called the gum or gums, and is covered by a strong outer coat of squamous epithelium known as the mucous membrane.

The gum tissue which lies to the occlusal of the crest of the alveolar process is called the gingiva. Black has termed its subdivisions the body of the gingiva, and the free gingiva, or free gum margin. The body of the gingia surrounds the neck of the tooth, being attached to the gingival portion of the peridental membrane. The free gingiva extends occlusally from the gingival line, hugs the enamel tightly but has no attachment thereto. Dense bundles of fibres from the peridental membrane extend into the free gingiva and hold it in firm contact with the enamel.

The crownwise extension of the free gingiva differs in various mouths, its length being from 1 to 4 millimeters. It is longest in youth; diminishing as age advances. While it fits closely around the gingival third of the tooth crown, a thin, flat instrument may be easily passed between it and the enamel to its attachment at the gingival line, the gingiva thus enclosing the immediate gingival margin of the enamel. In young persons, we often see one-half of the length of the crowns of the teeth buried in the gingiva even after the teeth are regarded as fully erupted. As age advances, the gingiva becomes shorter, showing more of the crown, and finally receded to very near the gingival line.

The gingiva also fills the larger portion of the interproximal spaces in the form of septa passing between the teeth from labial, or buccal, to lingual. This portion of the gingiva, which Constant terms "the inter-dental papilla," and Black calls the "septal gingiva," is much longer than that on the labial and lingual surfaces of the teeth. In normal conditions it reaches from the gingival line to the contact-point between the teeth, completely filling all of the space rootwise from the height of contour. By "height of contour," is meant the line of vertical tangents which indicates the points of greatest lateral contour of the tooth crown, and divides the clean from the unclean surfaces—the line which marks the gingival extremity of the food-swept area of the axiel surfaces. The form presented by the gingiva on the labial and buccal surfaces is a series of imperfect semi-circles with the concavity toward the occlusal surfaces of the teeth, and with the points of junction of these extending into the embrasures. On the lingual side of the arch, the conditions are much the same, but the points of the gingiva between the teeth are less prominent. As age advances and the gingiva recedes toward, or even to the gingival line, the septa of soft tissue fail to fill the septal spaces. This may induce pathological conditions by affording space for lodgment of debris in pockets, which favor fermentation. A like condition is also induced frequently by a faulty form of proximal contact, or through the flattening of the contact points by wear, which allows food to be forced into the inter-proximal space, and to break down the gum septum by its pressure.

This arrangement of the soft tissues around the teeth, the covering of the gingival third of the axial surfaces and the filling of the septal spaces, appears to be a peculiar provision on the part of nature; and as nature does not develop an organ without a definite purpose, it might be well to consider the possible advantages of such an arrangement of the soft dental tissues.

The mouth, with its ever present conditions of moisture, heat and suitable pabulum, makes an ideal incubator for most classes of micro-organisms. The gums covered by their layer of mucous membrane, which serves as a protective integument, seem to be immune to the influence of mouth bacteria; but the peridental membrane, a deeper tissue, which is never normally exposed to the secretions of the mouth, is readily infected when exposure comes. Carefully compiled statistics show that more teeth are lost after 25 years of age through disease of the peridental membrane than from all other causes combined. They also demonstrate that, aside from alveolar abscess caused by infection through the root canal probably 99 per cent of peridental diseases begin at the gingival border. The first step in disease of the gingival border of the peridental membrane is inflammation of the gingiva, with subsequent relaxation of its fibres, when, instead of hugging the tooth tightly and preventing the entrance of anything from the mouth into the gingival space, it becomes loose, a pocket forms, food matter and micro-organisms collect, and inflammation of the peridental membrane occurs, which, if not cured in its incipiency, is followed by pyorrhea and the ultimate loss of the tooth.

Your essayist, after considerable study of this disease, believes that every case of pyorrhea is preceded by a gingivitis and relaxation of the fibres of the gingiva, the formation of a pocket in the gingival space and infection from the mouth. As long as the gingival is normal and healthy, pyorrhea cannot occur. Considering that so large a percentage of our work consists of the treatment of this disease, and that pyorrhea when once fully established is extremely difficult to control, the question arises, is there any dental tissue more necessary to conserve than the gingiva whose healthy condition makes pyorrhea impossible?

If we again examine a normal skull we will see that while the teeth touch at their proximal surfaces by what is called contact points, spaces of considerable size, termed inter-proximal spaces, occur between them. These inter-proximal spaces are bounded by the planes of the occlusal, buccal and lingual surfaces of the teeth, and by the crest of the alveolar process. The inter-proximal space is divided into the septal space, and the buccal and lingual embrasures. Where these spaces are of improper form and size, the efficiency and longevity of the denture are proportionately impaired.

Examination of a healthy mouth will show these spaces to be filled by the gingiva to the height of contour of the axial surfaces. To this portion of the inter-proximal space that is occupied normally by the septal gingiva, or gum septum, Black has given the name septal space. So long as the septal space is occupied by healthy gingiva, food matter will not become packed therein, with its subsequent fermentation, caries of enamel, gingivitis and peridental disease. But when anything interferes with this normal gum septum, some, or all, of the conditions mentioned rapidly follow.

Long experience and careful observation on the part of intelligent operators indicates that caries of enamel never begins beneath a healthy gingiva, and that when decay has commenced on the unclean gingival half of a tooth surface its spread on the enamel surface stops at the gum line. No definite reason for this inhibitory action of the healthy gingiva upon dental caries has ever been given except possibly the observations recorded by Black in his work on the Periosteum and Peridental Membrane, published in 1887, wherein he calls attention to a slight secretion developed by the gingival glands in the sub-gingival space. Your essayist has noted a similar inhibitory action exercised by the gingiva on the progress of erosion, and in the study of that disease has seen numerous instances where the gingival extension of the erosion stopped at the gum line; but he has never seen a case where the eroded area extended beneath the gingiva.

If the gingiva can be maintained in a healthy condition pyorrhea will be prevented and some of the more serious lesions of dental caries, such as proximal, gingival third, and senile decay, can to a large extent be avoided. The important functions of the gingiva being established, what steps can we take to insure its proper maintenance? Obviously by considering the conditions that give rise to its injury and by taking measures to avoid or prevent them.

What conditions threaten the health of the gingiva?

First—Faulty contacts between approximating teeth. These may be due to poor contour of the tooth (thick necked teeth); the flattening of the contact points into surfaces of contact by the lateral wear of the teeth from years of use in mastication; the loss of the occlusal third of the teeth from abrasion caused by the excessive chewing of tobacco, and similar habits; the undermining of contact points by decay; failure of the dentist to reproduce the proper rounded form of contact point on a proximal filling or the proximal surface of a crown or inlay. Faulty contact points permit food to be forced through the contacts and to impinge on the gingiva, causing successively, discomfort, inflammation, recession, gingival pockets, infection of the peridental membrane and pyorrhea.

Second—Another class of conditions inimical to the gingiva might be termed "Get Rick Quick Operations." These are usually performed by the dentist whose slogan while a student was, "No theory for me, please; give me practical dentistry only," and whose whine, after years of operative failures, is, "Why didn't they teach me better in college?"

These are the conditions where, from excessive proximal decay, the teeth have moved together mesio-distally, the interproximal space has been largely obliterated and the proximal surfaces are in contact almost from gingival line to marginal ridge. The embrasures are greatly constricted; there is practically no septal space, and the gingiva has been squeezed back to the gingival line. The operator is too busy, or too lazy, or too ignorant to appreciate the conditions, or too incompetent to remedy them; so for some, or all, of these reasons he fills or crowns the tooth in the manner that causes him least inconvenience, and the patient retires more injured than benefited, carrying with him one more of the innumerable dental abortions that give rise to the well meant strictures of a Hunter, or other critics, and cause the conscientious practitioner to blush for shame for such crimes committed in the name of dentistry. When our leaders, our scientists, point out the importance of the inter-proximal space, the necessity for separation, proper contour, contact points, form and size of septal space, even that fundamental therapeutic principle based on the pathology of caries of enamel, viz: "Extension for Prevention," do we welcome them as teachers who come to show us how to save teeth, how to become proficient in our calling: Or, do we rather, metaphorically, crucify them for theoretical heretics who come to make our work harder? Meanwhile we salve our professional conscience by proclaiming how much of the patient's tooth structure, and time, and money we have conserved—until another teacher comes along and shows us what promises to be an easy way of transmuting wax fillings into gold ones; then we forget all about the necessity for conserving tooth structure, or the patient's time and money, but cut as far as may be required for the mechanical steps of the operation.

The restoration of the mesio-distal breadth of the inter-proximal space; of the concavo-convexity of the proximal surfaces; of the rounded contact points; of the wide-open buccal and lingual embrasures; of the properly placed height of contour; the extension of cavity outlines to areas protected by the scouring action of the food, or the contact of healthy gingiva; the maintenance of the integrity of the gingival line and the attachment of the peridental membrane at the point—these are some of the commandments of the gospel of scientific dentistry, and they cannot be neglected with impunity.

Anything that interferes with the normal size and form of the inter-proximal space, such as the conditions cited, or improperly adapted crown bases, or crown bands, excess of filling material left at the gingival portions of cavities where it will not be seen (until the tooth is extracted) and when it is "too much trouble" to properly contour; one and all of these conditions preclude the possibility of a healthy gingiva.

Another condition that must be guarded against is injury to the attachment of the gingiva at the gingival line by the improper use of ligatures; the placing and maintaining of a rubber dam in position for a considerable time without previously cleansing the field of application; the failure to remove salivary or serumal calculus; the improper use of scalers in such removal, whereby the operator's ignorance of the location of the gingival line results in his severing the attachment of the peridental fibres at that point; any use of finishing instruments, disks or strips that injures the gingiva; and finally the extending of the gingival wall of a cavity beyond the gingival line as is very likely to be the case where the gingial wall is made concave from the occlusal as is done in round bottomed cavities.

The improper use of the toothpick by the patient in his endeavor to dislodge impacted food from faulty inter-proximal spaces is also a prolific cause of injury to the gingiva.

Any of the conditions enumerated may be sufficient to start a train of lesions that will ultimately result in the loss of the teeth. And not only this, but some of the seemingly simple exposures of the peridental membrane through injury of the gingiva, are sufficient to permit the development of foci of infection that may give rise to serious systemic disturbances, or complicate already existing general disorders, and retard recovery therefrom.

With these things in mind is it not high time that we devoted more serious thought to the gingival tissues and their proper treatment and conservation?

The first step in the examination of the mouth should be a careful study of these tissues, and any slight departure from a healthy appearance should be investigated and the cause removed. Repair of lesions of the hard dental tissues is a simple matter compared to the alleviation of advanced lesions of the gums or peridental membranes and as the health and usefulness of the teeth depend very greatly upon healthy investing tissues, therefore the intelligent study and treatment of the gingiva becomes our primary duty to our patients.

The other source of danger in connection with the development of focal infection in the mouth is the alveolar abscess. This abscess always begins in the apical portion of the tooth socket, and is always caused primarily by infection through the root canal. It is alway preceded by the death of the pulp.

The death of the pulp from causes other than infection through a carious cavity is so infrequent that the same need not be considered at this time. Certainly if dental caries can be prevented, or checked in its early stages, dead pulps and alveolar abscesses will become rare conditions. To accomplish this desirable result requires a knowledge of the pathology of dental caries; and the application of such knowledge to the development of definite preventive and remedial measures.

The dentist who looks upon dental caries as an obscure condition which manifests itself by causing holes in the teeth is quite likely to consider the stuffing or plugging of those holes as the ultimate purpose of operative dentistry. The fact that decay more frequently recurs around his "plugs" means little to him, for he argues that if the perfect tooth decays why should not the repaired one continue to do so.

A careful study of the phenomena of dental caries, however, will soon convince us that the cavities of decay that develop in the teeth are not mere accidents, or the result of purely physical influence, but that they are symptoms of a disease, which is distinguished by very definite points of beginning, periods of activity, manner of progress, etc. Once dental caries is recognized as a disease it is not impossible to prevent it in many cases; nor is it very difficult to control its progress or prevent its recurrence.

Inasmuch as the limits of this paper will not permit of a thorough treatment of the subject of dental caries the essayist will confine his remarks to a few brief statements regarding certain well recognized phenomena of the disease.

Caries is a disease that is practically universal in the human family. So prevalent is it that not more than 3 per cent of mankind are immune. But this doesn't mean that the unfortunate 97 per cent of us who have decayed teeth necessarily suffer from the disease at all times. On the contrary dental caries is manifestly a disease of childhood and adolescence; and those of us who have had intelligent care of our teeth between the ages of 4 and 20, rarely suffer from the disease thereafter, unless it be during prolonged periods of great vital depression, or lowered resistance.

Neither are all portions of tooth surface equally susceptible to dental caries. A careful study of the beginnings of caries will demonstrate that certain portions of the teeth rarely, if ever, become the initial point of decay; while there are other places which are practically always the first to succumb.

For the sake of brevity some of the important features of the pathology of caries will be stated in axiomatic form. These are not arbitrary statements, they are based upon careful observation, and have been amply substantiated.

1. Decay does not begin upon tooth surfaces that are kept scoured by the food in vigorous mastication, unless there are defects in the enamel of those surfaces, such as pits and fissures, which permit micro-organisms to penetrate to the dentine, where the grinding action of the food cannot sweep off the tooth structure.

2. Dental caries can be divided into four stages or classes.

3. The first class, or primary stage, of dental caries is the first to appear, and begins in the pits and fissures (defects) that, as the result of incomplete enamel formation, are found in the occlusal surfaces of molars and bicuspids; the buccal and lingual grooves and pits that sometimes occur in the occlusal portions of those surfaces; and in the lingual pits of upper incisors.

This class of decay is the first to be seen in the mouths of young patients and is marked by the fact that the orifice of the cavity is always small, and the interior usually large. On account of the small orifice, and the large, deep interior this type of decay is spoken of as penetrating decay. The penetration is due to the fact that the decay has ready access to the dentine through the original enamel defect, and a long time to progress without interruption. The orifice remains small because the micro-organisms are prevented by mastication from spreading on the surface and thus enlarging the opening.

4. The second stage of decay is proximal decay. It always begins just to the gingival of the contact point, and spreads on the surface of the tooth only as the septal gingiva is forced back, leaving the enamel surface exposed. Its penetration through the enamel is slow, as the enamel at this point is seldom defective; therefore, this type of cavity is spreading rather than penetrating. Cavities of this class are usually several years later in manifesting themselves than are the pit and fissure cavities. Once the dentine is reached, however, the contact point is readily undermined and is broken away by lateral pressure of the teeth; the inter-proximal space is lessened, the septal gingiva recedes, debris collects in the pockets that are formed; gingivitis occurs and frequently chronic suppurative pericementitis (pyorrhea) results.

5. The third stage of caries is gingival third decay, which attacks the buccal surfaces of the molars and the labial surfaces of the upper incisors and cuspids, but very rarely the lingual surfaces of the teeth. Many patients never suffer from this type of cavity, and when it does occur it usually comes late in the adolescent or early adult period. The cavities begin near the gum about midway mesio-distally of the gingival third of the tooth. For a long period they pass as superficial decay, which spreads over this area until it reaches a point at the mesial or distal, or occlusal, where the scouring action of the food limits its spread. It always stops at the gum line if the gingiva be healthy.

After a considerable lapse of time the enamel is penetrated and the dentine reached. This type of decay is called spreading decay. It penetrates slowly because the enamel is perfect and presents no defects to permit rapid penetration. It spreads over a large surface because the surface is unclean, and mastication does not scour off the colonies of micro-organisms.

6. There is a fourth stage of caries, senile decay, which begins in the cementum beyond the gingival line, but this is always preceded by such injuries to the gingiva that the carious cavity is greatly exceeded in seriousness by the soft tissue lesions that have given rise to the gum recession necessary to permit the development of this type of decay. It takes its name from the fact that it is most frequently found in the mouths of elderly patients.

If the dentist has a knowledge of the immune and the susceptible areas of tooth surface, is familiar with the stagse of caries, and knows where to watch for the beginning of the disease, he should be able to combat it in its incipiency, and peremanently protect the invaded surfaces so that the pulp does not become endangered.

If we can maintain the health of the gingiva, and control caries so that it does not reach the pulp, we can prevent pyorrhea and alveolar abscesses, and thus insure the protection of those two prevalent areas of focal infection. When dentistry woth the aid of the patient has accomplished this, and it can be done by conscientiously applying the principles laid down by G. V. Black, focal infection in the mouth will have been conquered, and the answer to Dr. Mayo's challenge—"Will dentistry take the next great step in preventive medicine?" will be that "Modern dentistry has taken that step."

OCULAR DISEASES OF DENTAL ORIGIN.*

(A COLLECTIVE ABSTRACT)

BY WM. F. HURDY, M. D., ST. LOUIS, MO.

There has arisen in the last few years considerable literature bearing on oral sepsis and the resultant effects on the human economy by reason of its presence. Oral hygiene is now the order of the day. How our ancestors got along is unknown. The condition of the teeth of savages is usually referred to as excellent, therefore, if this be true, something in our modern way of living, and especially of eating, must have a bearing on the question. What the dentists say regarding sweets, candies, etc., I know not, but there is no disputing the fact that the per capita consumption of sugar by the American people has increased tremendously in the last four decades.

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*Read before the St. Louis Dental Society, March 6, 1917.

One of the greatest faults we must get away from is in being satisfied with the discovery of one etiological factor. We must look for and first treat the obvious, but should keep in mind other possibilities. For instance, an individual may give a four plus Wassermann, and yet his iridocyclitis may actually be due to an apical abscess or other cause. This point has been emphasized by De Schweinitz and others. While not a dentist, and therefore, unable to justly pass on any dental procedure, it has always seemed to me that the old style gold cap crowns were unsurgical and unscientific. Retraction of the gums leaves an area of exposed tooth between crown and gum subject to attack by the mouth secretions and bacteria. It seems no wonder that gum abscesses and deeper infections should result in such cases, to say nothing of the impossibility of keeping the mouth clean. If wrong I am willing to be corrected. It may be an erroneous impression, but I have been imbued with the idea of ipsolaterality of the lesions where an ocular complaint and dental abscess were co-existent. It might be argued that the infection or toxic agent being in the general circulation homolaterality would have no place. But, if the infection is in the general circulation why are not both eyes more frequently simultaneously affected? May it not be possible that a route other than the blood exists? Numerous studies have been made of the bacterial flora of the mouth, and of the pus of root abscesses. The frequency with which streptococcus viridans is found is remarkable. The lethal properties of this organism are well known. They probably exist in most cases in an attenuated form, and that only their toxins pass into the circulation.

Studies in oral sepsis have done much to clear up some very obscure medical problems—myositis, arthritis, *i. e.* rheumatism, and arthritis deformans are cases in point. Various strains of streptococci have been traced from oral foci to the joints and muscles. It is not too hypothetical to assume that the eye can in like manner be involved. The investigation of Billings' Rosenow and others have pointed the way. While my remarks include ocular troubles, the result of oral sepsis of all kinds, yet especial attention is given to apical abscesses of the teeth. Ocular troubles due to teeth may be classified under two heads, as follows: 1st—Reflex, 2nd—Inflammatory. The inflammatory troubles may result from (a)—General oral sepsis, (decaying teeth, lack of cleanliness, etc.),(b)—Pyorrhea, (c)—Apical or root abscesses. It appears that the uveal tract is susceptible to the infections originating in the mouth, which goes far to clear up the etiology of many heretofore puzzling cases. De Schweinitz emphasizes the fact that the infection in uveits may come from a small tooth root abscess, the presence of which is not suspected and often undetected until X-rays are employed, and even these are sometimes difficult of interpretation. Cases illustrating this are recorded by F. C. Todd and De Schweinitz.

A. D. Black (Op. Rec., Vol. 24, p. 610) has given us a very valuable contribution on ocular disease, resulting from dental lesions. Black, who is a dentist in addition to being a physician, has looked at the problem from a dental point of view. Ocular diseases of dental origin should, he states, be divided into two groups: (1)—Reflex neuroses presenting as sensory vaso-motor or muscular disorders. (2)—Inflammations of the various tissues of the eye due to infections. The first group does not concern us in this evening's discussion. The second group does however. According to Black, when the eye symptoms are of a toxic or infective nature, the condition of the peridental membrane should be investigated. There are two pathological processes which involve the peridental membrane: (1) Alveolar abscess which always occurs subsequent to the death of the pulp. (2) Chronic suppurative pericementitis, so called pyorrhea which always begins at the gingival margins and gradually invloves and cuts away the peridental membrane from the root, forming a pus pocket. There are two routes of transmission from the mouth to eye, endogenous, the common, and exogenous, the rare. Endogenous transmission may be by blood stream, lymphatics or direct continuity of tissue. Black reviewed the articles in one series of dental journals from 1839 to 1915 and appended to his article the bibliography and also a summary of the ocular diseases caused by mouth lesions, arranged as a crossed reference. Because of its value I have given it in full.

Ivy (*Wisconsin Med. Jour.*, May, 1916) contributed an interesting article, "Chronic Mouth Infection in relation to systemic Disease." He deals with the subject in a general way, no particular reference being made to ocular diseases. The summary of the evidence in support of the view that foci of infection in the mouth at times play an important etiological role in certain systemic diseases, is worth repeating. (1)—Streptococci can nearly always be demonstrated if proper technique be used, in closed areas of chronic periapical infection. (2)—These areas as demonstrated by histological sections have a direct connection with the blood and lymph streams through which the infection may reach other parts of the body. (3)—Rosenow has been able to produce in animals with streptococci isolated from mouth foci, the same systemic lesion as was present in the patient. (4)—Marked improvement or even disappearance of the particular systemic condition affecting the patient frequently follows removal of sources of chronic streptococcal infection in the mouth. Among the diseases mentioned are secondary anaemia, acute and chronic arthritis, myositis, neuritis, and various eye lesions. An interesting feature of Ivy's routine examination is the determination of response of each tooth to the Faradic current.

The researches of Hartzell show that over ninety per cent of all apical infections yield cultures of the streptoccocus viridans.

Ivy found streptococcus viridans in a large percentage of his cases.

Haskins speaks of the manner in which the body suffers from oral septic foci; 1—From the constant absorption of the toxins that are produced during the growth of many bacteria; 2—From the actual invasion of the blood stream by the bacteria themselves. The first is said by Haskins to be by far the most common condition. To quote him: "Filling the septic abscesses at the gingival border are the septic teeth whose roots project up into the pockets and act as hydraulic pumps with each act of mastication, forcing the soluble toxins into the circulation even though no bacteria escapes." Haskins reported seven cases of ocular trouble of dental origin.

Impacted upper bicuspid and third molars are said to be prolific sources of trouble.

Three cases of eye disease of dental origin were recorded by Foucher (*L'Union Medicale du,* Canada, 1895).

Ulrich showed that in over 68 per cent of all artificially devitalized teeth apical abscesses were found.

Haskins (*Dental Cosmos,* Oct., 1916) has shown by X-ray demonstrations how impossible it is to successfully fill all root canals. For this reason, the removal of any doubtful tooth is urged.

De Schweinitz (*Ophthalmic Record,* 1915) points out that the organisms in a septic mouth are perfectly capable of producing a non-septic uveitis although the primary lesion is suppurative.

Ibershoff (*Journ. Ophth. and Oto. L.,* May, 1915) writes concerning carious teeth as a factor in ocular disease. Reference especially is made to vitreus opacities and three case reports given. In the cases he reports the mouths were in a foul condition, and demanded treatment for hygienic if for no other reasons. Where the mouth is a hot bed or a morass of infection the way is clear but great difficulty arises in patients whose mouths are apparently in good condition. Emphasis is laid on apparently.* Pyorrhea is frequently mentioned as a factor in producing eye diseases, such reports have been made by Tibbles (*Brit. Med. Journ.,* Jan., 1914), Agnew (*Iowa State Med. Journ.,* 1915), W. Lang, Goulden, and others. Tibbles reported two cases, one of choroiditis, and another of iridocyclitis, the result of pyorrhea.

Goulden (*R. L. O. H. Rep.,* Vol. XIX, pt. 3) collected some information, gleaned from a study of 6385 patients, concerning the role of diseased mucous membranes in causing uveal troubles. Of 142 cases of iridocyclitis, 64 were caused by septic teeth. Of 9 cases of disseminated choroiditis septic teeth caused one. The same cause produced two cases in four, of single patch choroiditis with keratitis punctata. Among his conclusions he arrived at the following: (1) That it is most likely that many cases of uveitis other than those due to syphilis and tuberculosis, are due to infection from a diseased mucous membrane. (2) That the most common cause of uveitis is oral sepsis.

Beaumont (*Brit. Med. Journ.,* Sept. 26, 1914) discussing the evolution of toxaemic iritis, succinctly stated that the haematogenous theory of infection has led to the aetiological dethronement of iritis from the position of an independent disease to the secondary one of a complication. He further states that great attention is now paid to possible areas of infection, be they in the nose sinuses, alveolar pockets, gastro-intestinal tract or prostate. Septic absorption from these areas may be the aetiological factor in a given case of iritis. The association of dental disease with iritis is perhaps more generally observed than are other sources of sepsis. Lang's statistics are quoted as showing that about 64 per cent of cases of iritis attributed to sepsis are caused by pyorrhea; this is due no doubt to the great prevalence of pyorrhea. One should not be prejudiced, however, by the presence of a pyorrhea and lose sight of a possible gonorrheal, luetic or other infection. Attention to dental sepsis is imperative and Beaumont näively says that it is better to lose thirty-two teeth than one eye. With this statement I do not expect you to agree.

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*Normal but in reality pathological teeth.

Mac Whinnie (*N. Y. Med. Journ.*, Oct. 18, 1913) believes that in quite a few cases the ocular disturbance is due to diseased teeth which may show no evidence of decay, the trouble only being found when the X-ray is employed or exploration is done. Spasm of accommodation, hemorrhages of the eye and temporary blindness are mentioned as results of tooth root trouble. Two cases are reported, one of spasm of accommodation totally unrelieved by glasses but given relief in 24 hours following the evacuation of pus at the root of a cuspid. The second case was one neuralgic pain in the right side of the face and with vision O. D. reduced to 6/30. Extraction of an upper molar evacuated pus but the pain continued and relief was not afforded until five days later when the lower molar was extracted. Within an hour all pain subsided and the vision quickly rose in the eye to 6/10.

Voelkers (*Dental Cosmos,* Nov., 1916) reports a case of iritis cured by attention to the teeth. The usual blood, tonsil, gastrointestinal and rhinological examinations had been made with no results. Recurring attacks of iritis covering a period of three years had occurred. The mouth was in a bad condition; Voelkers made radiographic pictures, cleaned up the mouth and extracted three teeth with a rapid subsidence of the iritis. An interesting point was that when a sinus of the left lateral incisor was treated, with a treatment sealed in with gutta percha, and left for a few days, the eye symptoms would gradually return; with the removal of the treatment there was always a flow of serum sometimes containing blood. After extraction of this tooth all the iritic symptoms disappeared.

Hiram Woods (*Ophthalmic Record,* Nov., 1915) reported recurring attacks of uveitis in a lawyer 48 years old. These attacks covered a number of years and were apparently traced after two years to alveolar absorption. Woods is suspicious of all conjunctival redness unaccompanied by secretion and thinks it is a forerunner of deeper and more serious trouble. In the case described there was conjunctival injection followed by vitreus opacities, signs of a mild iritis and descemetitis. A "dead tooth," crowned, was finally removed with a sudden exacerbation of all symptoms, sight dropping markedly; a later return to nearly normal vision occured. This is of course but an isolated case, but it seems only fair to draw the conclusions which were drawn by the author. Again an indictment is drawn against the crowned tooth.

Dr. Lucie Oesterreicher (abstr. in *Dental Cosmos,* 1915, p. 1312) in a report of the eye clinic in Prague, made the statement that almost all patients suffering with exzematous kerato-conjuctivitis also show considerable dental caries. An absence of potassium sulfocyanate is shown in the saliva. Medication with this substance abbreviated the course of the ocular trouble. It is furthermore innocuous.

Davis (*Dental Cosmos,* Vol. 57, p. 769) discusses in a general way the inter-relation of the teeth and the eye. He has observed in his own work numerous instances of faulty accommodation, either insufficiency or spasm, which were of dental origin.

Another article touching on the subject is by Daly (*Dental Cosmos,* 1915, p. 47).

In conclusion it appears that not only are the teeth capable of causing ocular trouble but that they frequently do so. The mischief may be expressed as a reflex trouble exidencing itself as a pain or discomfort about the eyes, as a phoria, *i. e.* a lack of ocular muscle balance, or as an anomaly of accommodation either fatigue or spasm. It may be expressed as an inflammatory condition affecting particularly the uveal tract. Pyorrhea, a frequent cause, is usually easily diagnosticated by a competent dentist, but apical abscesses hidden and unannounced in a clean mouth and with teeth to outward appearances normal, provide the greatest difficulties to be surmounted in arriving at the correct diagnosis. Patients are loath to sacrifice apparently normal teeth and the cost attendant on a complete radiographic examination is in many instances prohibitory.

The argument is raised that the connection between tooth and eye affections is too hypothetical and problematical, and that they are not related in cause and effect, but are coincidental. This view is based on the great prevalence of tooth affections and the relative infrequency of an associated eye disease. But the same is true of syphilis, gonorrhea, and tuberculosis. How common are these and how relatively infrequent are ocular diseases the result of them. Yet no one disputes a syphiletic, gonorrheal or tuberculosis iritis or keratitis. It is incumbent upon ophthalmologists to consider the teeth in our list of possible aetiological factors but to refrain from making of this possibility a hobby to be ridden to death.

Finally a plea should be made for closer co-operation bewteen dentist and ophthalmologist, dentistry and medicine in general. I believe the progressive and alert dentist to be as much so as his brother physician, and relatively as numerous. On various occasions I have risen to the defense of dentists and have ever found them ready to adopt modern methods, and viewpoints, and new proceedures. All branches of medicine demand greater and closer teamwork now than at any previous time. Focal infection, and under this head come mouth infections, are being carefully studied at present. The one danger to be guarded against is the overdoing of it. However, in an obscure aetiology where other factors can be and have been eliminated we are justified in looking to the teeth as a possible cause and enlisting and help of the dentist.

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Accommodation, diminution or loss of, 21, 23, 24, 25, 38.

Amaurosis, 1, 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, 18, 20, 21, 23, 25, 27, 35, 36, 37, 38.
Amblyopia, 21, 23, 24, 25, 38.
Blepharospasm, 21, 37, 38.
Cataract, 24, 28.
Chronic Ophthalmia, 13, 25.
Conjunctivitis, 21, 24, 25, 28, 38, 40.
Corneal inflammations, 21, 38.
Exophthalmos, 21, 25, 38.
Extra-ocular muscles, spasms or parlysis of, 23, 28, 38.
Fatigue, 33.
Glaucoma, 21, 25, 38.
Hypermetropia, 28.
Iridocyclitis, 28, 25, 38.
Iritis, 25, 34, 38.
Kerato-scleritis, 24, 25.
Lagophthalmus, 21, 22, 25.
Mydriasis, 21, 24, 28.
Miosis, 38.
Neuralgia, 2, 29, 33, 35, 36, 37, 38.
Optic Neuritis, 24, 25.
Orbital abscess, 23, 38.
Phlyctaenular ophthalmia, 21, 25, 28.
Ptosis, 19, 25.
Sclerotitis, 22, 23, 25.
Strabismus, 21, 38.
Uveitis, 39.

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(4) Amaurosis from Decayed Teeth. Excerpt. Tabez Hogg in *London Lancet—Dental News Letter,* 1857-58, p. 160.

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(28) Goulden, *Dental Cosmos,* 1911, p. 216.
(29) Merritt, *Dental Cosmos,* 1911, p. 1445.
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(36) Dutrow, *Ophth. Record,* May, 1915, p. 253.
(37) Ibershoff, *Jnl. Ophthal. and Oto.-Laryng.,* May, 1915, p. 141 and July, 1915, p. 209.
(38) Woods' Amer. Encyc. of Ophthalmology, Vol. V., p. 3817.
(39) Woods, *Ophthalmic Record,* 1915, p. 547.
(40) Black, G. V., p. 370, *Special Dental Pathology.*
(41) Gilmer, *Archives Internal Med.,* 1912, p. 499.

MOUTH HEALTH.*

BY J. P. CARMICHAEL, D. D. S., MILWAUKEE, WIS.

My Dear Miss President, Members of the Chicago Dental Society, Fellow Doctors:

No one probably realizes more fully than the dental practitioner the great importance of a subject that so vitally concerns the health and welfare of the nation, as the topic that has been selected for our discussion this evening. I address you with the feeling that this subject is of far greater importance than any other matter pertaining to the practice of dentistry today. The public is looking to the dental profession to guide and direct them along those lines that will preserve their teeth, which means not only strong physical bodies, but health and happiness in their old age. We alone realize what a healthy mouth means to every individual. As dentists, we know that diseases of the mouth are wholly preventable, yet we appear at a loss to bring these facts forcefully to the attention of the public, or to disseminate our knowledge to the extent that would assure a life-long service of the teeth.

In my 35 years experience I have often been embarrassed and sorely grieved at the ignorance of people of refinement and education, regarding their teeth. A beautiful, well kept set of teeth, not only adds to the animation and expression of the countenance, but is a mark of intelligence. Patients, unless possessed of teeth of unusual luster and beauty, generally fail to recognize them as anything other than means of mastication, and only see fit to visit a dentist when they have a toothache.

There are none among us here this evening who do not recall a case regarding which he has said, "that man's teeth killed him." We give our advice as forcefully as we can, yet how lightly it is taken.

The victim does not suspect the insiduous character of dental diseases, that in many cases progress with little or no pain.

Among those diseases which may be mentioned as developing the most deadly foci of infection, are diseases of the apical region, and chronic conditions of pyorrhea.

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*Read before the Kenwood Branch of the Chicago Dental Society, April 3, 1917.

It is commonly known that when we have a well marked aveolar abscess, or an infected third molar, the infection spreads to the surrounding tissue. By the use of oxygen vapor, we can easily trace the channels through which infection travels; at times we can observe its course through the intercellular tissue, from the teeth directly to the tonsils, which is evidence that these organs often become infected from a diseased condition of the teeth.

The infection having established itself in the oral tissues, drains into the general system, through the medium of the lymphatic or circulatory systems, producing general systemic disturbances.

And why all this, when preventive measures make it possible to maintain a clean, healthful mouth? There is no part of the human anatomy deserving of more respect than the oral cavity. Everybody is fastidious in regard to what he consciously puts in the mouth; yet the diseased mouth breeds filth beyond description and would not be tolerated by anyone who realized the true condition. We pride ourselves on the advancement of dentistry in this country, yet an examination of the teeth of our soldiers at the Mexican border necessitated the hold back of fifty per cent of the men for dental reasons. So it would appear that the masses have given the subject of mouth health little or no attention.

Statistics show that only fifteen per cent of the people patronize the dentists in regard to the welfare of their teeth, the other eighty-five per cent are content with what they may learn from coming in contact with others, and cleaning the teeth occasionally with any commercial article, regardless of its composition and the effects that may result from its use.

Therefore, it all resolves itself into one great topic, that of dental education, and we realize that this subject matter to be made effective, must be imparted to the youth at that time of life when the mind is most easily impressed and at that age when the care of the teeth is most important. *In this field, the oral hygiene movement in our public schools will accomplish more for health than all the other philanthropic activities combined.* The divergence of opinion for many years in the dental profession, arguing over the matter of constitutional and local causes of diseases of the mouth, greatly stagnated our progress, in bringing forth those measures which would best maintain mouth health.

All dental literature today, setting forth the opinion of our best scientific writers, holds to the theory of local causes, allowing of course, that local causes are augmented by constitutional effects. May I put this statement in another way? *Allowing that nature's forces of resistance in the oral cavity are unbroken, and the mouth is found in a perfect state of health, there will be no condition of the constitution that will primarily produce oral diseases.* However, I believe that if there be an infection of the gum tissues, which is primarily one of the early stages of dental pyorrhea, and the system becomes broken by constitutional disease, a far more rapid development of the condition will then follow, and especially during the period that the constitutional disturbance prevails.

The measure of success to be attained in the treatment of disease, and the practice of preventive measures to be adopted, is dependent upon the accuracy of the knowledge we have of the causes producing the diseased condition. Recent research, both clinical and experimental, have proven conclusively, that all diseases of the oral cavity are preventable. This conviction finds its support in the fact that is now definitely proven, that dental diseases are wholly of an infectious nature.

The comparatively recent awakening of the dental profession to the full significance of this fact, has instituted a new epoch in dentistry. The practice of old, in which the effects of disease were the object of attention, has given way to the more modern idea, of which the cause is made of more concern.

In the event that an infection remains localized in the gum for a period of time, certain destructive secretions are poured out at the gum border, in the region of infection, which produce marginal abrasions. This secretion also enhances the bacterial activity of decay, and may be considered a prime essential in the dissolution of the adjacent tooth texture. The teeth and the gum structures about them being intimately related, the health of the teeth depends upon the health of the gums. The teeth and the gums involved in an infectious process present certain features that are common to both, and when one of these structures becomes diseased, the other is likewise affected.

Disease producing germs find culture media for their development in the broken down organic tissues of the mouth. When nature's forces of resistance are overcome, bacterial invasion follows, producing inflammation; we cannot arrest decay of the teeth, so long as there remains an unhealthy condition of the gums. The soft deposits beneath the loose gum margin supply ideal culture media, and provide an ideal harbor for the development of bacteria. The exudates that flow from an inflamed tissue, mingle with the mucin and foreign sticky matter that form a slimy coating over the teeth and gums, heavily laden with disease producing germs. The logical way, then, of eliminating germ activity from the mouth is to remove by mechanical means, the bacterial placques and culture beds favoring germ development.

The conditions that we are called upon to treat in the oral cavity are due to a mixed infection, consisting of many varieties of germs, including many pathogenic bacteria that are harbored in the oral cavity, and, in fact, all these germs are so tenacious that they resist an antiseptic of a strength that would destroy the living tissue. The only possible means, then, of freeing the mouth from bacteria, is to remove all putrescent matter and other organic deposits that serve to favor bacterial growth. A proper dentrifice should certainly contain those essential properties, which will free the teeth and gums from deposits that would encourage microbic development, and at the same time, maintain a normal flow of the secretion.

In a healthy mouth nature has provided normal functions for warding off diseases, among which may be mentioned, a highly polished surface of enamel from friction of food in mastication, thus producing a proper functioning of the gum tissue, a healthy flow of saliva, all of which, when properly maintained, serve to establish immunity to disease. If then, we would assist nature in warding off disease, we must eliminate in a dentrifice, all sweet, sticky, gelatinous and starchy substances, as well as hard crystalline and organic grit that would mar the enamel surface.

I have spent five years in careful research and clinical observation, calling upon the aid and co-operation of the best men in the dental profession, upon the one subject—maintaining a healthful mouth condition. My co-operation with others in this field has gone far to establish my conviction, that the whole practice for the home care of the teeth has been founded upon error. We know that all inflammation is due to invasion of bacteria into the living tissue. We know equally well that it is impossible to destroy the germs of disease, after they have once invaded the tissue. We know, too, that the only possible means of eliminating bacteria after it has invaded the tissue, is by means of the fighting power of the blood. If, knowing then, that bacteria which have found lodgement in the oral cavity cannot be destroyed without killing the living tissue, would not their removal seem to be the only sane and logical procedure? And to accomplish this, we can remove the culture media that makes for and encourages bacterial activity.

It is a noteworthy fact, that dental pyorrhea has become more prevalent since the advent of the tooth paste and tooth creams. In our commercial tooth powders, too, are found ingredients identical with those commonly employed in all bacteriological research work to develop and propagate bacteria. For instance—gelatin, soap, sugar, starch, flour, and even honey. They are common ingredients, to make matters worse, we find in the tooth pastes, in order to maintain a certain consistency and to prevent its settling and hardening in the tube, a gluey substance of some character—usually gum tragicum. We are sure that this gum gives microbes a firm hold.

If we condemn, we must construct. I have been greatly impressed with the clear and exhaustive description of a proper dentrifice given by Dr. Hermann Prinz, an eminent authority upon the subject under discussion. In his papers on "Oral Hygiene," published in the August number of the *Dental Summary* he sums up his conclusions as to those essentials that should constitute a good oral prophylactic preparation.

First: It must be absolutely indifferent in regard to
(a) The mucous membrane—non-caustic.
(b) The teeth—non-decalcifying (mechanical or chemical.)
(c) The organism as a whole—non-poisonous.

Second: It must not interfere with the normal physiologic cleansing of the oral cavity.
(a) It must not inhibit the secretion of saliva.
(b) It must not perceptibly alter the reaction of saliva.
(c) It must not destroy the ferments of saliva.

Third: It must possess sufficient cleansing action, combined with

Fourth: Good taste and odor.

Dr. Prinz also cautions us that unless the correct composition of a ready made mouth or tooth preparation is known, it should not be recommended.

This outline is in accord with what has always been my thought and endeavor to the end of developing a dentrifice that would meet the requirements of maintaining a healthful mouth, as well as that of treating a specific condition; the former claiming our attention this evening.

A tooth powder is no better than the ingredients which constitute its base. The base should possess a quality of resistance that will cleanse the teeth without abrasion, yet leave no deposits, either sticky or mechanical, to irritate the gums. Please consider the following formula:

Diotamaceous earth, incorporated with a natural carbonate of calcium and magnesia, as a cleaner and polisher, in combination with beta-napthol and thymol, as antiseptics; powdered sodium bicarbonate for a mild alkaline re-action; powdered boracic acid, as an antiseptic and to inhibit bacterial action; sodium citrate, a neutralizer, to stimulate natural flow of secretion. All combined with an agreeable flavoring material.

The distinctive property of this base is the quality it possesses of occluding and holding all detachable foreign matter, and carrying it away. Its cleansing properties are of organic origin. They readily combine with water to form a paste, which so freely mixes with water, that upon rinsing the mouth, the residue as well as the microbic placques are washed away. A non-grit organic base of this character has the quality of cleansing the teeth without scratching or dulling the natural luster.

Thus far, all is accomplished that is possible with a dentrifice applied by means of the tooth brush. With the tooth brush, it is impossible to remove the infectious matter that constantly accumulates beneath the loose gum margin, and between the teeth, at which point nearly all dental diseases have origin. There is, perhaps, no other treatment so beneficial in allaying gum inflammation as the daily taping of the necks of the teeth with a tape containing a soft antiseptic powder.

It is a demonstrable fact that the tooth surface may be kept burnished and lustrous by a dry rub, without any appreciable loss of enamel surface, and this is nature's way of maintaining the state of brilliancy in which the tooth effectively wards off diseases. In order to use a friction powder and apply it to the teeth dry, suggested the idea of a tooth napkin, which is a small muslin square with the friction powder incorporated in the cloth, ready for use. The many ways in which the tooth napkin can be used makes it a valuable adjunct to the tooth brush, especially as a means of maintaining a polish to the tooth, and furnishing a healthful massage for the gums. The napkin is especially pleasing to children who are apt to object to the tooth brush.

The importance of mouth health, and its influence in maintaining the general health of the body, is recognized as being of such significance, by the leading members of the medical profession, that many will not undertake the care of patients whose mouths are in an unhealthy condition. They demand that such patients first receive proper attention at the hands of a dentist.

The largest business enterprises, where efficiency is a paramount factor, and especially those institutions maintaining a pension fund, will not consider an applicant with unhealthy teeth, just as the United States government does not consider its soldiers fit for active service until they have passed the test requiring every fighter for the American flag first of all, to measure up to the principles set forth in the teachings of mouth health. Recognizing that sound gums mean healthy teeth, we shall insist upon prescribing the correct treatment for our patients. I can honorably say from the result of my experience with the measures just outlined, that, if systematically followed, they will mean to the practitioner greater permanency of result from his operations, and therefore, more abiding respect from his patients.

REPORT OF COMMITTEE ON DENTAL SCIENCE AND LITERATURE.*

BY DR. HERBERT A. POTTS.

A review of the science and literature of dentistry in the past year indicates a steady advance. The interest of the medical profession, sometimes overzealous, has stimulated the dentists to greater activity, which must necessarily lead to discoveries, new methods of practice and improving the old ones, thereby increasing our store of knowledge and providing better service for our patients.

In general it has drawn our attention to the fact that we have in the past been treating teeth and not patients. Oral prophylaxis, I believe, had as its original intention the prevention of decay of the teeth, but now it has a far wider scope and include the prevention of general decay. If dentistry conserves the health and efficiency of its patrons and it seems that it can, it behooves the one practicing it to go the limit in preparation and by study and reading become familiar with the conditions which might give rise to the various ills of mankind, which he, being "only a dentist," does not see because of the fact that the sick one consults his physician and not his dentist, notwithstanding the fact that the very cause of his illness lay, in many cases within the mouth and in many cases was due to the efforts of the dentist whose sole aim was to restore his teeth.

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*Read before the Illinois State Dental Society, May, 1917.

Controversies have naturally arisen. As it requires the conservative to hold down the enthusiast, the results of their efforts each upon the other always approaches the truth.

OPERATIVE DENTISTRY.

While there has been considerable written during the past year it seems there is nothing really new.

PROSTHESIS.

There has been in this field a revival of work and reports of the same as there has been in the field of crown and bridge work. Some recent studies in metallurgy have been reported. In looking over the vast number of articles which have appeared under this title, one gets the general idea that the trend is toward a higher plane and that this has been stimulated by a desire to construct dentures along a more hygienic line with the least possible mutilation of soft tissues and teeth. There is a constant effort being made to construct dentures which are self-retaining, particularly in partial plates which will retain the denture at times other than during mastication, and that the stress of mastication may be borne by the dental ridges.

CROWN AND BRIDGE WORK.

In this field as in the foregoing there has appeared a mass of literature and the tendency has been, I think, along the lines of non-irritation. While there has been nothing absolutely new, the trend of the whole subject seems to be to avoid placing gold bands beneath the free margin of the gums, substituting a shoulder or jacket crown.

These with the view of conserving the pulp. Much effort has been expended to produce removable bridges, avoiding as far as possible placing bands beneath the free margin of the gums.

ROOT CANAL FILLING.

In the treatment and filling of root canals the literature seems to point toward an improvement in technique rather than in any new method or substances used. The paper of Dr. E. S. Best on "Root Canal Filling" which appeared in the *Dental Cosmos,* February, 1917, and that by Dr. Coolidge in the May number of the *Dental Review,* 1916, should be mentioned.

ORAL SURGERY.

It may be said that a new treatment of wounds of the face and oral cavity as shown by the experiences of some of our oral surgeons on the continent during this war is the revival of the old open method as practiced in pre-antiseptic days. This being required because of the almost constant infection from the gas bacillus. Dr. George E. Meyer's paper on "The Experiences of an Oral Surgeon in about one year's service with the First Expeditionary Service Abroad" deserves special mention.

There has been increasing interest shown in oral surgery generally, especially of malignant disease about the mouth by means of the thermo-cautery and radium. Dr. George E. Pfahler, *Journal of the A. M. A.,* November 18, 1916, and "Pre-existing Lesions of the Oral Cavity and their Relation to Disease" by Dr. J. Colt Bloodgood, appearing in the DENTAL REVIEW for May, 1917.

ORTHODONTIA.

Of chief note in this field is the announcement of a new appliance in orthodontia (the ribbon arch) by Dr. E. H. Angle in the September number of the *Dental Cosmos,* 1916.

RADIOGRAPHY.

The paper by Dr. Hollis E. Potter, "The Roentgen Rays in the Diagnosis of Pyorrhea," appearing in the *Journal of the A. M. A.* of February 10, 1917, and a paper by the same author in collaboration with Dr. Louis J. Pollack entitled "Experimental Studies of the Gasserian Ganglion Controlled by Fluoroscopy" appearing in the *Journal of the A. M. A.,* November 4, 1916, deserve special mention.

ANESTHESIA.

The studies of Dr. George W. Crile as given in the *Journal of the A. M. A.,* December 6, 1916, entitled "An Experimental Research in the Nature of Nitrous Oxid and Ether Anesthetics with Special Reference to Certain Relations to Organs of the Body and Their Relations to Normal Sleep—Hydrogen—Ion Concentration and Infections" deserves special mention and shows that for a bad risk patient nitrous-oxide is to be preferred and that analgesia with local anesthesia should be employed with general anesthesia only when it is demanded by certain phases of the operation.

LOCAL ANESTHESIA.

There has been a constantly increasing demand for local anesthesia both in dentistry and in general surgery. We have the promise of a new non-toxic local anesthetic from one of our leading pharmaceutical houses, but as yet they have not been able to put it on the market, on account of war conditions. This anesthetic has been tried out by some of our surgeons and so far has proven up well. It is to be hoped that we will soon be able to procure it.

ORAL PROPHYLAXIS.

Of real interest along this line is the fact that physicians are giving more attention to the care of children's teeth as shown in the routine examination of school children, and we may rightly mention the article of Dr. Thomas C. McCleave which appeared in the *Journal of the A. M. A.,* July 29, 1916.

From the standpoint of economics we may with profit read the article by Dr. Carl E. Smith in the *Journal of the A. M. A.,* January 13, 1917, entitled "Bad Teeth and Their Effect on the Laboring Man's Efficiency," also the communication by Dr. E. H. Thomas entitled "Dental Service at the Chicago Plant of Montgomery Ward and Co.," DENTAL REVIEW, February, 1917. As a sign of the times I might mention that I recently received a request from one of our large insurance companies asking my opinion and data concerning the effects of primary focal infections existing within and about the mouth upon the general health and longevity of the individual. This, it seems to me, is a cry for better dentistry and increased life insurance premiums.

VACCINE-THERAPY

There has been in the past year a great deal written regarding vaccine-thearapy. It has, as we all know, been much abused as many of the favorable reactions from vaccines may be accounted for by the injection of the foreign proteins. An excellent article from the pen of Dr. D. J. Davis in the *Journal of the A. M. A.*, January 20, 1917.

BACTERIOLOGY.

Two new books have appeared, namely, "General Pathological and Intestinal Bacteriology," by Dr. A. J. Kendall, 1916, and "Practical Bacteriology, Blood Work and Parasitology," by Dr. E. R. Sitt—Fourth Edition, 1916.

METASTATIC INFECTION.

There has been a good deal of interest displayed by both the medical and dental professions during the past year and a mass of literature written on this subject. As an introduction to the subject we may mention "A Clinical and Experimental Study of the Metastatic Arthritides" with a review of 859 cases from the clinical and animal experimentation of the late Dr. John B. Murphy, reported by Dr. P. H. Kreuscher in the Official Bulletin of the Chicago Medical Society, December 9, 1916.

There seems to be no end to the articles and reports of clinical cases dealing with the effects of focal infections within the mouth. Among them the secondary diseases of the eye, neuritis, arthritis, myositis, infection of the gall bladder, gastric and duodenal ulcers, endocarditis, myocarditis, arteriosclerosis, goitre, and even insanity.

The diversity of the secondary infections is shown in an article by Dr. Thomas L. Gilmer published in the *Dental Cosmos* for December, 1916, entitled "A Clinical and Experimental Study of Chronic Alveolar Abscess in Relation to Systemic Disorders." Also the paper by Dr. Rosenow on "The Relation of Dental Infection to Systemic Disease," published in the *Dental Cosmos,* May, 1917.

PYORRHEA.

The status of the branch is best shown in the Symposium on Pyorrhea before the Section of Stomatology A. M. A. at the Detroit meeting, June, 1916, published in the *Dental Summary,* April, 1917, viz.:

Roentgen Ray in the Diagnosis of Pyorrhea, by Dr. H. E. Potter.

The importance of a correct differential diagnosis of the predisposing causes in cases of interstitial gingivitis or pyorrhea alveolaris, Dr. M. L. Reece.

Bacterial Findings and Their Relationship to Pyorrhea and Interstitial Gingivitis, Dr. A. W. Loecohier.

Some studies in the Treatment of Pyorrhea Alveolaris, by Dr. G. B. Harris.

The Etiology and Treatment of Interstitial Gingivitis, by Dr. E. S. Talbot.

PATHOLOGY OF THE PERIDENTAL MEMBRANE.

Renewed interest has been shown on this subject exemplified by the paper of Dr. F. B. Noyes which appeared in the April *Journal of the National Association,* and the second and third will be in the June and July numbers, 1917.

In a paper before the Section of Stomatology of the A. M. A. in Detroit, Dr. F. B. Noyes reported his experiments demonstrating "the lymphatics of the dental pulp," published in the *Cosmos* for April, 1917.

REPORT OF COMMITTEE ON NECROLOGY.*

BY DR. W. T. REEVES, CHAIRMAN, CHICAGO.

To the President and Members of the Illinois State Dental Society:

We pause for a brief period in our deliberations to pay honor and respect to the memory of our departed comrades who during the past society year have passed across the border to join the great majority.

Your Committe on Necrology begs leave to report as follows:

DR. MARGARET L. SAFFORD.

Dr. Margaret L. Safford, a member of Knox County Dental Society, died at the Galesburg Hospital, May 15th, having undergone a surgical operation the previous week.

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*Read before the Illinois State Dental Society, May, 1917.

Dr. Safford was born August 6th, 1872, at Hamilton, Illinois, whither her remains were conveyed for interment. The Knox County Society attended the funeral in a body.

After studying dentistry at the Iowa State University, and later at the Northwestern University Dental School, graduating in 1903, she located at Galesburg where she successfully practiced till her death. Dr. Safford became a member of the State Society in 1905.

DR. FRANK HARRISON STAFFORD.

Dr. Frank Harrison Stafford was killed June 24th, 1916, by being crushed between a street car and an auto truck at the corner of State and Randolph streets, Chicago. He was born in Ohio, June 2nd, 1866, graduated from the American Dental College March 24th, 1891, later from the Northwestern University Dental School in 1892. He took two courses. In his profession he was an inventive genius, and possibly over-conscientious in his efforts, forgetting his own physical self and the commercial side in his effort to do conscientious work. He enjoyed his work and leaves a large clientele to regret his departure. As a man he was a Christian of a very pronounced type, and never lost the opportunity to suggest the possibilities of religion as a panaca for our troubles. As a friend he was loyal; as a husband and father he was true and faithful, his highest ambition being to have a Christian home. We, as a profession, part from him with memories of love and kindness, grateful in our hearts that his life was a part of ours. Dr. Stafford leaves a wife and son, to whom our sympathy is exttended.

DR. CHARLES RUDOLPH EDWARD KOCH.

Dr. Charles R. E. Koch died of heart failure at the home of his daughter, Mrs. Josephine Crane, at Newtonville, Mass., July 21, 1916.

Dr. Koch was born at Birnbaum, Polish Prussia, April 24, 1844. He came to America in infancy and was brought direct to Chicago.

At an early date he began the study of dentistry, in which he developed a keen interest, in the office of Dr. Kennicott. In August, 1862, at the age of nineteen, he left his studies to enlist as a private in the 72nd Illinois Infantry. He served in many important campaigns, chief among them being the Vicksburg campaign and siege, after which he was detailed as a clerk in General Ranson's headquarters. He was appointed captain of the 49th U. S. C. T. and detailed on the staff of Lorenzo Thomas, adjutant-general organizing the colored troops in the Southwest. He was provost marshal at Yazzo City, Miss., from May to August, 1865. In March, 1866, he was mustered out after honorable mention.

He married Miss Sylvia Bigelow of Grafton, Mass., June 25, 1868. He had rejoined Dr. Kennicott in 1866 and became his partner in the pratice of dentistry until 1871. He then practiced alone until 1898.

Colonel Koch organized and was captain of a company of Union veterans, serving in the labor riots of 1877, and when the Illinois National Guard was organized he enlisted as a private in the 1st Infantry.

He became a captain of the company in October, 1877, and rose in rank, until he voluntarily retired with the rank of colonel. At the outbreak of the Spanish-American War he organized a regiment, which he maintained at his own expense for more than four months. The regiment was accepted by the state.

He then began to take an active interest in the work of the army veterans and the G. A. R. in general.

Colonel Koch was past commander of the Loyal Legion of the United States, past adjutant-general of the Grand Army of the Republic, and president of the Grand Army Memorial Hall Association.

In 1875 Dr. Koch was elected president of the Chicago Dental Society, and two years later president of the Illinois State Dental Society. From 1886 to 1891 he was president and secretary of the state board of dental examiners, and in 1891 became president of the National Association of Dental Examiners. He received the honorary degree of D. D. S. from Washington University in 1888.

Dr. Koch was appointed secretary of the dental department of Northwestern University in January, 1904.

Dr. Koch, from the time of his official connection with the Dental School of Northwestern University, became an active force in the betterment of dental education, and a sympathetic and efficient worker in the ethical development not only of the students under his care, but of the whole dental student body, upon whom he relied to elevate dental professional standards generally. In pursuit of that ideal he became one of the organizers and promoters of the Omicron Kappa Upsilon, an honor organization having its representation in the principal dental schools of America, and membership in which is attainable only by those whose collegiate records both ethically and professionally are of the highest order. Of this organization Dr. Koch was the national secretary.

By reason of his high prefessional ideals and his strong personal influence, it may be truly said of him that he was an honor to the profession of his choice, which he bettered and elevated by his quiet unobstrusive and efficient life activities.

"He was the author of "History of Dentistry" and "Illinois at Vicksburg." For the last several years he has had charge of the monuments for Illinois graves on Vicksburg field. He was instrumental in sending a number of hospital units to Europe last year.

Dr. Koch joined the Illinois State Dental Society in 1867 and had attended thirty-six of the annual meetings. He prepared and read several papers on dental subjects, and took part in numerous discussions on the floor at all times. He was always working for the betterment of the society, and in this had the keen preception to see what was for the advancement and good of the society; and the sound judgment that enabled him to plan and advise means and methods to accomplish that end. In this direction he read a paper before the 1884 meeting, "The Illinois State Dental Society, what It has Accomplished." In 1889 he read a History of the First Twenty-Five Years of the Society. In 1895 he read a paper, "A Commentary on the Dental Law of 1881." In 1904 he read a paper, "The Advantages of Organization." This had reference to the proposed reorganization of the society, which was accomplished soon after. In 1905 he was made chairman of the legislative committee and was reappointed each year until his death. It was in his active work on this committee that most of those present, know of his valuable services. He was a great man—great because he served. We all will miss him.

DR. R. A. SMITH.

Dr. R. A. Smith, of Spring Valley, died Sunday, August 20th, following an operation for a ruptured appendix. He was born at Courtland, Ill., in March, 1876. He graduated from the Chicago College of Dental Surgery in 1899, and at once located in Spring

Valley, where he became prominent in his profession, as well as in social and civic affairs.

Dr. Smith joined the State Society in 1905, and was a valuable and active member of the La Salle County Dental Society, serving as its president in 1912. He leaves a wife and two sons.

DR. LOOMIS POMROY HASKELL.

Sadly we record the transition of Dr. L. P. Haskell from pain and sorrow to eternal rest and peace. His death occurred Saturday, October 7th, at the Presbyterian Hospital, Chicago, following two operations for kidney disease. He was in his ninety-first year. The funeral services were held Monday, October 9th, at the Presbyterian Church, Hinsdale, Illinois.

Dr. Haskell was born in Bangor, Maine, April 25th, 1826. It may be interesting to know that in his teens he became an apprentice in a printing office, and later helped "get out" the earlier editions of the Youth's Companion, and the Wellspring, a Sunday School paper. At nineteen he took up the profession of dentistry as his life's vocation, following it continuously for seventy years. He came to Chicago in 1856 from Boston, where he began practice in 1845. For almost thirty years he resided at Hinsdale, Illinois. The past nine years he made his home with his only surviving daughter, Mrs. Wm. T. Barr, of La Grange, Illinois.

Dr. Haskell was present at the birth of the Illinois State Dental Society in 1865, having been one of its charter members. It is, therefore, with a special sense of regret that we give expression to the profession's loss of a high-minded, gentle and useful member. He held several administrative offices in the State Society, read numerous papers, took part in many discussions, the last in 1914, and gave a clinic as late as 1913.

Dr. Haskell has been acclaimed the oldest practicing dentist in this country, and probably in the world. For a period of three score years and ten he devoted his energies to the development and betterment of dentistry, all the while ministering to the comfort and well being of his fellowmen. In that his life lapped the fast-running sands of theirs, he was contemporaneous with Hayden, Harris, Taylor, Wells and others, of revered memory, whose tireless efforts to establish dentistry as a distinct profession, with organizations, colleges and literature of its own, were showing signs of fruitful accomplishment. Thus Dr. Haskell began his professional career early in the renaissance of dentistry in America.

But Dr. Haskell's claims to distinction rest not alone on the accidental circumstance of having witnessed the marvelous development and progress of the science and art of dentistry.

We are told that prosthetic dentistry is almost entirely an American achievement. It was in this branch that Dr. Haskell excelled, and with which we associate his name, and to which he brought his fine intelligence and skill of the highest order. In surmounting obstacles and solving complex problems of individual cases that presented he was a past master. His success was not of the kind which was heralded frequently in the journals, yet the influence of his work was felt throughout the country and even beyond its confines.

To place the benefit of his skill and rich experience in the hands of the profession he founded the Haskell Post Graduate School of Prosthetic Dentistry, from which, it is said, were graduated pupils from nearly every country on the globe. Many of these were given the privilege of later honoring Dr. Haskell, for after his seventieth year he three times visited Europe, giving clinics in London,, Paris, Berlin and Vienna and other cities. He highly prized a number of loving cups which were presented on these trips.

Dr. Haskell was one of the old guards of courageous pioneers who, by unceasing devotion to high ideals, took a man's part in the struggle for placing dentistry upon a firm scientific foundation and aided largely in developing dental art. His success was won by his brain, and hands, and tireless energy. He brought to his work a rare insight as to needs and methods; years of concentrated study and experience; high ideals, and the results he achieved closely approached those of genius. With these went a kindliness and sympathy which made him as widely loved, esteemed and venerated as was the circle of his acquaintanceship.

Dr. Haskell was elected honorary president of the American Dental Congress, held in San Francisco in 1915 at the Panama Pacific International Exposition.

In the passing of this Grand Old Man of Dentistry the dental world has lost a valuable member who, during a long and useful life of notable achievement, always exemplified the highest standard of professional traditions and excellence.

Dr. Haskell was very fond of the appended poem. We commend it to our readers:

OUT OF THE SILENCE.

(By John D. Wells, in the *Buffalo News.*)

And what can you say when the day is done,
And you've gone to your bed of rest?
When the shadows come and the light has gone
O'er the rim of the golden west,
And a silvery beam of the moon creeps in
As if in an aimless quest?
What do you say
When a kindly voice that you seem to know
Out of the shadows speaks soft and low,
"Well, what did you do today?"

Oh, what can you say when you're all alone
With the Master of all the tasks?
How much of a sin do you have to own
When the voice of the Master asks—
How many things have you left undone
Your studied answer masks?
What do you say
When out of the shadows of the silent night
The Master speaks with the Master's right;
"Well, what did you do today?"

Thrice blest is he of the humble way
Who sinks to his bed of rest—
The rest he has earned with a toiling day
With love of his labor blest—
Who hears the voice of his Master ask
And truthfully says, "My best."
The man who can say
"I've trod the way of my best intend,
I've helped a friend and I've made a friend,"
To "What did you do today?"

DR. VAN RENSELAER DAVID.

Dr. Van Renselaer David died November 14, 1916.

Since last May, Dr. David has been at the Hinsdale Sanitarium. Just before noon he went over town to the barber shop to get shaved and was delayed somewhat, and in hurrying back to the sanitarium for dinner he stepped in front of a train.

He was hurled several feet; though his body was not bruised to any great extent, both legs were broken.

He was picked up unconscious and taken to the sanitarium, where he died about four o'clock without regaining consciousness.

Van Renselaer David, son of James and Caroline David, was born near Scranton, Pennsylvania, March 27, 1830, and died at Hinsdale, Illinois, November 14, 1916, in his 87th year.

He was the eldest of eleven children, four of whom survive him—Oliver, of Scranton, Pennsylvania, who only two weeks before his death made a pilgrimage to the west to see him; Mrs. Griswold of Chicago. Mrs. Flood of Florida, and Mrs. Griffith of Canada.

He was married in 1852 to Maria Davies, and to them were born four children—James, who died in his 17th year; Dora, wife of Gustave Goodman of Sandwich; Mrs. Lillian Breckenridge and Dr. Frank E. David of Chicago; one granddaughter and three great grandchildren also survive him.

Dr. and Mrs. David came to Illinois in 1856 and settled in Newark, where he practiced dentistry until 1865, when he removed to Sandwich, continuing in the same profession for fifty years.

As a dentist Dr. David enjoyed the distinction for many years of being without a rival in this part of the country. People came to his office from many miles distant. As a citizen he was highly esteemed, for he was public spirited and generous. As a man he was beloved by all who knew him. In his family relationhius he was a model. His devotion to his aged parents, his brothers and sisters, as well a to his wife, children and grandchildren was marked. He possessed a clear, analytical mind, a keen sense of humor, combined with optimism of a high order.

He was made a Master Mason in Meteor Lodge No. 283, A. F. and A. M., Sandwich, Ill., June 14, 1866, and has been a Master Mason more than fifty years.

He was made Worshipful Master of this lodge in 1894; he was made a Royal Arch Mason in Sandwich Chapter No. 107, R. A. M., March 22, 1869.

For many years he had been a member of the Congregational church of Sandwich.

Dr. David's body was taken to the home of his daughter, Mrs. Goodman, where the funeral service was held, conducted by Dr. J. M. Lewis. The burial was at Oak Ridge.

DR. G. H. LIEPART.

George Hampson Liepart, D. D. S., died at his residence, 207 North Elmwood avenue, Oak Park, Thursday, December 17, 1916, after a long illness.

Dr. Liepart was a graduate of the Chicago College of Dental Surgery in the year 1904. He practiced on the West Side until four years ago, when he moved his office to Oak Park. He had a large circle of friends in both communities. Dr. Liepart was a member of the National Dental Association, the Illinois State Society, the Chicago Dental Society, and a faithful worker in the West Suburban Component. He was a member of Oak Park Lodge No. 540, A. F. & A. M., and Lodge No. 141, I. O. O. F.

Dr. Liepart is survived by Mrs. Liepart and four children, Elizabeth, Gertrude, George H., Jr., and Laura.

The funeral was held at the residence Sunday afternoon, December 10, Rev. Arthur Hoffman, of the Eighth Presbyterian Church, Chicago, conducting the services; burial at Oak Ridge.

In the passing of Dr. Liepart the community has lost one of its noblest characters, and the profession a competent, conscientious member.

DR. PHILIP MECK SWINEHART.

Dr. Philip Meck Swinehart was born in Lancaster, Pennsylvania, January 14, 1871. He was the son of Martha and Jesse Swinehart. He graduated from Ada College, Ada, Ohio, and in early life engaged in the profession of teaching. He united with the Brethren Church twenty-six years ago, and shortly thereafter took up the ministry. He held pastorates in a number of congregations in Pennsylvania and Ohio, later moving to Enon, Iowa. He was a conscientious worker and well beloved by all who came to know him.

In the year 1901 he took up the profession of dental surgery, graduating from the Chicago College of Dental Surgery in the year 1905. He at once established an office in Englewood district of Chicago, where he built up a large and successful practice among a people who came to love him as one of their own, and among whom he labored until the hand of death was laid upon him, at about eight o'clock Sunday afternoon, January 21, 1917.

He was united in marraige to Miss Marion M. Talley, daughter of Mr. and Mrs. J. O. Talley, on August 19, 1913, with whom he lived an affectionate, faithful and devoted husband, and passed from life under her faithful ministrations. The end came without warning; he had waited on patients until noon, and came from the office complaining of dizziness, which later developed into headache. They sent for his favorite doctor, Dr. Bellsen, who spent the afternoon with him visiting, giving him proper attention. The doctor left about seven o'clock, and within one hour he was dead from cerebral hemorrhage.

Kindly of heart and sympathetic, his life was peaceful and placid. He had in his heart a place for everyone. A consistent Christian who exemplified most beautifully a conception of the Christian brotherhood.

He leaves to mourn his loss in his sudden demise a faithful wife, five brothers, three sisters and a host of other relatives and friends.

Dr. Swinehart was a member of the Chicago Dental Society, Illinois State Dental Society, National Dental Association, and the Dentists Mutual Protective Alliance.

Services were held at the late residence, 1733 West Forty-seventh street, Chicago, Illinois, at 2 p. m., Thursday, conducted by Dr. B. H. Fleming, pastor of the Western Avenue M. E. church, after which the remains were laid to rest in Oakridge Cemetery.

DR. WILLIAM SIMPSON WALLACE.

Dr. Wallace died March 2, 1917.

While reading a charge to a candidate in Hope Lodge No. 162, of which he was Master, Dr. Wallace became ill and remarked that he would have to quit and sit down. He grew rapidly worse; in a few minutes it was noticed he was partially paralyzed and became unconscious. He was speedily taken to his home, but he never recovered sufficiently to speak, and died Saturday afternoon. The attending physicians pronounced his ailment cerebral apoplexy.

William Simpson Wallace was born in Pinckneyville, Ill., January 6, 1871. His parents were South Carolina people, coming to Illinois in 1868 from Chester district, and engaged in farming near Pinckneyville, where his father died in December, 1870. His mother, who was a sister of late Dr. J. C. Simpson, died May 21, 1909. Dr. Wallace, after graduating at Pinckneyville high school, determined to become a dentist, and came to Sparta and took his elementary lessons under Dr. Simpson. In 1893 he became a student in Washington University at St. Louis and graduated in 1896, and settled in Sparta for the practice of his profession in the office of his uncle.

In September, 1899, Dr. Wallace married Miss Ida Baird, of Pinckneyville, a daughter of Mr. and Mrs. Alexander Baird, one of the prominent families of that place, and early day residents of Randolph county. Mrs. Wallace survives her husband. He is survived also by one brother, Thomas, who is engaged in the drug business at Pinckneyville.

While not active in politics, Dr. Wallace was a Democrat. He was president of the Sparta Fair Association, an officer of the Sparta State Bank, member of the Southern Illinois Dental Society and the state Society, a director in the Sparta Building and Loan Association, was a 32nd degree member of Masonic order, a member of First Presbyterian Church. He was an exemplary citizen, pleasant companion and associate, and will be greatly missed from business and social circles, as well as from the church and fraternities. His bereaved wife and brother are supported by the sympathy of all friends of the family.

The funeral was held from the First Presbyterian church, Monday, at 2 p. m., March 5, 1917, and was conducted by Rev. Dr. A. B. Von der Lippe, the pastor, assisted by Rev. Albert Harris of the M. E. church, Rev. J. P. Nisbet of the United Presbyterian church, Rev. W. J. Smiley of the R. P. Church, and Rev. H. G. Foster of the Covenanter Church. The funeral was very largely attended, many relatives and friends coming from Pinckneyville, St. Louis and other points. The Masonic order attended the funeral in a body and officiated at the grave.

DR. JOHN ELIHU COMBE.

Doctor Combe died February 20, 1917, at El Paso, Texas.

In company with his brother, C. E. Combe, he was enroute home from Deming, N. M., having left there on Sunday previous. His condition became worse after leaving Deming and he was removed from the train at El Paso and taken to a sanitarium but gradually lost strength and expired Tuesday evening.

The remains arrived here on the 1:27 train Friday and were taken to the Combe residence where the body laid in state until Sunday at 12 o'clock when funeral services were held at the Congregational church and interment made in Gullick cemetery. Rev. George McKenzie of St. Louis and Rev. Scott of Alton officiated at the funeral and burial, and the ritualistic work of the Masonic fraternity was used, in part at the church and in part at the cemetery.

The funeral was attended by a large number of our townspeople and friends of the deceased from other places. The A. F. & A. M., the Order of Eastern Star and the Turners attended in bodies and a great wealth of floral offerings attested the great esteem in which the deceased was held.

John Elihu Combe, son of Louis Combe and Ernestine, nee Rogier, both deceased, was born on a farm near Sebastopol on December 9, 1875. After attending a district school he entered McKendree College at Lebanon and was graduated from the institution. Later he completed a dental course in the Marion-Sims College, St. Louis, and established himself in the practice of his profession in Highland and was very successful. A year ago his health began to fail, and December 6th last he went to New Mexico in the hope that the change of climate would help him. The effect was beneficial until a week previous to his death, when he suddenly became worse and a few days later arranged to come home. His brother, Attorney C. E. Combe, of Harrisburg, going there for the purpose of accompanying him back.

Doctor Combe was remarkably devoted to all members of his family and especially those whose health was not of the best. His iron will kept him at his work and at what he conceived to be his filial duty long after his failing strength should have warned him to desist. Death came too soon to such a man as he.

The following deaths have been reported for which no data has been secured.

Dr. W. H. Banicklow, Chicago.
Dr. C. J. Hadley, Chicago.
Dr. F. H. Fiddyment, Blue Island.
Dr. O. D. Swain, Glencoe.
Dr. J. M. McCullough, Sycamore.

Your committee asks the privilege of filling out this report, if any information is secured on the above names before the proceedings of this meeting goes to press.

All of which is respectfully submitted.

H. L. Minnis,
F. C. Hopkins,
W. T. Reeves, Chairman.

REMARKS BY MEMBERS OF THE SOCIETY ON DR. KOCH IN CONNECTION WITH THE REPORT OF THE COMMITTEE ON NECROLOGY.

Dr. William T. Reeves, Chicago:

The officers and the chairman of the Program Committee thought that inasmuch as this was to be a memorial meeting to Dr. Koch, it would be fitting at this time to have a few short speeches in his memory, and in that connection I have asked Dr. Gilmer, of Chicago, and Dr. Blair, of Waverly, to say a few words about Dr. Koch.

Dr. Thomas L. Gilmer, Chicago:

I am unable, sir, to express to you in words what I feel should be said about our dear, departed friend, Dr. Koch. I do not believe there is a single individual present in this audience who does not feel a deep sorrow, especially those who knew him best, at the absence today in body of our departed friend. Those of us who knew him best know of the nobility of his character. He was a man that could be trusted under all circumstances, and if you were his friend you could depend upon him to aid you in any way and everywhere, regardless of time, labor, sleep or anything else. Dr. Koch had a vision always before him of something better, and that vision was in two directions; for the benefit of his comrades that were in arms and his comrades in the dental profession.

His last work that perhaps took him off prematurely was for the benefit of the soldiers that he had served with in the army. He went to Washington to secure the passage of a law. He went there to go before a committee after hard and arduous school work in the heat of the summer, and probably as a result of that he lost his life.

He had a vision for the betterment of dental education. Those of us who were associated with him in school work know how true this is. He was always thinking of what could be done for the betterment of dental education. He was always forward in every work of this kind in making suggestions and carrying out plans, and his suggestions were always pregnant with good things.

Dr. Koch was born, as has been reported, in a foreign land, in Poland, but if there ever was a true patriot it was he. He was an American first and all the time. No one hated war worse than he, but if war was to be, he would be in the thickest of it.

Dr. Koch, during the reconstruction period in the south following the Civil war, was placed in a very trying position. Many of you know perhaps who have read history that things were not made as pleasant for some of the people who had been in rebellion as might have been, but Dr. Koch won the love and the affection of the southern people with whom he came in contact. He told me time and again of letters he had received from people that he befriended while he was there in command in certain districts. I have seen him associating with ex-confederate officers, and I have seen him enjoying that association, and he has told me of his high regard for some of those who were on the other side and were opposed to him. When the war was over he fought no longer; he was a friend of all who were willing to be loyal to the country.

You all know how influential Dr. Koch was in getting legislation passed that was for the right—and why? How did he do it? By bribing legislators; by promising them something?

No. He did it by going to the committees of the Legislature with propositions which were right, and they could not do otherwise than to support him in his contention for the right, and that is the way he was successful. I have and have had a great many friends, but if I had something that I wished to have assistance and help about and did not want anyone else to know anything about it, I think he would have been the man of all others I would have gone to and he never would have failed me.

It is impossible for me to express to you in this offhand manner what I should like to say about this man because he was so good; he was so true, that I have not the words to tell you what my heart would like to say.

Dr. E. K. Blair, Waverly:

I do not feel that I should undertake to say anything regarding Dr. Koch. The thought uppermost in my mind at this time is the absent faces that I have known from this society. No face stands out in bolder relief, as I think of the members who have gone to their rest, than that of Colonel Koch.

Dr. Gilmer has paid him a splendid tribute, not drawn too strong, but well put, and I think I will say nothing other than to approve what he has said and to remind this Society that we have lost a substantial member that stood betwixt us and the public more completely, more thoroughly, and more intelligently than any other man I have known in this Society.

The President:

I would be glad to have any one else say a word or two about Dr. Koch.

Dr. J. G. Reid, Chicago:

I feel that I would like to contribute a word or two in regard to Dr. Koch for this reason: In the period of my life when I was engaged in other capacities connected with the state service, I was in closer touch with Dr. Koch, perhaps, than any one man in the state, and if I had anything I was particularly puzzled about and that needed very careful advisement I never went to anybody else but Dr. Koch to ask for advice, and I tell you this because it was always given in a true, honest, upright spirit. He never misconstrued anything. He told you just exactly what was right. He never misinformed you about anything, and no one has been better informed upon subjects regarding dental education than Dr. Koch was, and not only informed on dental educational matters of the world but in legislative matters. He was a man of wonderful capacity and his advice was always accurate. He never made a mistake in an opinion that he ever rendered, and what Dr. Gilmer has said to you I know to be true, and he has expressed it better than I could. But I feel in this expression it is my duty personally to offer just these few words in his memory.

Dr. Edmund Noyes, Chicago:

Last year this society by vote consecrated this meeting to be a testimonial to Dr. Koch with the confident expectation that he would be here to enjoy it, and I cannot tell you with what keen regret we miss the opportunity to say the things to him face to face which we would like to say. I need not enlarge upon what has already been said. There was no man that I ever knew who had so powerful an influence in legislative matters, in administrative matters, wherever he was concerned, as Dr. Koch, and it was due to two or three personal characteristics. Perhaps the most fundamental and most important was the almost infallible soundness of his judgment, but also to his transparent sincerity and disinterestedness. He was not seeking honors for himself. It was apparent to everybody who talked with him and came under his influence that his desire and efforts were for the welfare of those with whom he associated.

Dr. E. M. Robbins, Carthage:

May I drop a rose upon the bier of our departed friend. I shall not speak of Dr. Koch's connection with our state society because you all know that very well. Years ago, when I joined the society, there were a few of us who wore a bronze button. Dr. Koch was one, Dr. Black another, and Dr. Swain another. You who have not known the tie that binds those who faced the cannon's mouth and stood shoulder to shoulder, know but little of the feeling that is in the heart of the true patriot and soldier. (Applause.)

Dr. Arthur D. Black, Chicago:

In view of my very close association with Colonel Koch in more recent years I do not feel like letting this occasion pass without saying just a word.

Of all the members in this society, I question whether there has ever been one who has considered so little his own personal interest and so much the interests of other men as Dr. Koch. I had the opportunity which I very much appreciated during the last eight or ten years of his life to be very closely associated with him many times. He spent his last evening in Chicago at my house, and as Dr. Gilmer has said, there was never a time when Dr. Koch was not willing to lay aside anything and everything else to help some group of men who needed his advice and service. I doubt if very many of the members of this society appreciate the work that Dr. Koch did for us and for the dental profession as a whole in matters of legislation.

Dr. Koch told me a little story which is worth while repeating now as exemplifying the confidence that many men had in him in our halls of Congress and in our Legislature. A few years ago when one of our amended bills was up before the state legislature Dr. Koch was called before the committee when they were to consider this bill. The chairman of the committee said, as Dr. Koch came in, "Gentlemen, this is Colonel Koch; he wants to tell you about the dental bill. I asked the Colonel if the bill is all right and the Colonel said, 'Yes, it is.'" "Then the chair will entertain a motion that we recommend this bill for passage." (Laughter.) Dr. Koch then said, "Just hold on a minute, there are things about the bill that are not as we want them." "All right," said the chairman, "I will entertain a motion that the bill be recommended for passage when the Colonel gets it fixed," and this motion was made and carried in that form. I do not believe any other member of the society would get the same treatment before the legislature.

Dr. Koch did wonderful work for the men in this country who fought in the Civil War. He did a greater work probably than any of us can begin to appreciate. He was secretary of the Vicksburg Park Commission for the State of Illinois; he was chairman of the committee which spent many hundreds of thousands of dollars of the money of this state in erecting that beautiful temple on the Vicksburg field. He wrote a book on the work of the soldiers of Illinois at Vicksburg which is a very large volume and must have required an enormous amount of work and service to compile.

It was my pleasure to be with Dr. Koch for ten days during the ceremonies of dedicating the Illinois monuments. He had charge of two special trains from Chicago carrying more than a thousand people. He had arranged for all accommodations, provisions, entertainment, and everything for that whole party for a period of ten days, yet at the dedication services you would not have known that Dr. Koch was in the United States; he kept himself in the background, though there was no detail of that whole affair that he did not arrange.

Incidentally Dr. Koch has compiled a very extensive work on dental history. It is by far the most extensive work that has been written on the subject. Few of us know much about that, but as time goes on we will appreciate more and more the services this man rendered for us. (Applause.)

REPORT OF THE LEGISLATIVE COMMITTEE.*

BY G. WALTER DITTMAR, D. D. S., CHICAGO.

Mr. President and members of the Illinois State Dental Society:

In the absence of the chairman of this committee, Dr. Truman W. Brophy, I will make this brief report.

As was stated in President Whipple's address, this committee lost its most efficient and active member in the death of our past chairman, Dr. C. R. E. Koch. Dr. Brophy was then made chairman, and the vacancy in the committee filled by the appointment by the president of Dr. Arthur B. Black. I cannot recall anything of note having taken place until sometime in February, when the members of our committee were called to Springfield to interview Governor Lowden regarding legislation which would affect slightly our dental law. Governor Lowden explained to us his desire and purpose in having enacted what is now known as the "Administrative Code of Illinois," and then listened with an attentive ear to the desires of this committee which touched upon special legislation pertaining to dentistry. As it then seemed uncertain that the governor would succeed in having the legislature pass the bill providing for the Administrative Code of Illinois, he welcomed the suggestion of Dr. Black that the Illinois State Dental Society support and assist him by having its members write or telegraph to the members of the legislature requesting them to support the bill. This was done through the office of the secretary of this society.

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*Read before the Illinois State Dental Society, May, 1917.

During the past year the validity of our dental law was tested a number of times, particularly in the courts of Cook County, and it was found that there were a number of weak places in it.

Our State Dental Board, through the able, energetic and untiring efforts of the Board's special investigator, Dr. George N. West, conducted a number of prosecutions and found that our law needed amending, and the following changes have been submitted to the legislature which provide for an alteration or amendment in the following sections:

Sec. 5. What shall be regarded as practicing dentistry?

Sec. 7. When department may refuse or revoke license.

Sec. 16. Penalty—fines paid to department.

Sec. 18. Association, person, or company, engaged in practice to display names of persons in their employ. Penalty for not displaying names.

Title of new section No. 19. Employing unlicensed persons.

A new section is also submitted which provides that registered nurses may, after receiving proper instruction, clean teeth for children in the public schools and in public institutions. Other slight changes necessary to make our law conform to and harmonize with the Administrative Code of Illinois have also been made.

Since the passage by the legislature of the bill providing for the Administrative Code of Illinois, Governor Lowden has appointed Professor Francis W. Shepardson of the University of Chicago as Director-General of the Department of Registration and Education. The Chicago members of this committee recently had a conference with Professor Shepardson, who expressed his willingness and desire to co-operate with the Illinois State Dental Society in all matters pertaining to the elevation of dentistry and dental education.

Respectfully submitted,

E. F. Hazell,
O. G. Collins,
A. D. Black,
G. W. Dittmar,
T. W. Brophy, Chairman.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held March 20, 1917, with the president, Dr. George C. Poundstone, in the chair.

Dr. H. E. Friesell, dean of the Dental School, University of Pittsburgh, read a paper by invitation entitled, "The Prevention of Oral Focal Infection."

DISCUSSION.

Dr. Arthur D. Black:

It is a pleasure for me to open the discussion on this paper, as I am sure it has been a pleasure to you to listen to it.

I have enjoyed the acquaintance of the essayist for a period of 14 or 15 years and have come to know him as a man of good judgment, of high ability as a teacher, and as a good personal friend.

Most of us, and especially those of us who have been teachers in dentistry, have always appreciated the fact that there has been quite a wide difference between the teachings both in the dental schools and societies in the eastern states as compared with those of the west and middle west. We have looked upon the men of the east as being kind of hard-headed because they would not believe things the way we do out west. We have come to look upon Dr. Friesell as the one man above all others who is teaching western dentistry in the east; a man who has often come to Chicago to visit our dental schools, as well as the schools of many other sections of the country, and has come to believe the things that we believe here in the west; he is doing more than any one man today to illuminate the dental profession in the east with the light of the west.

This paper which Dr. Friesell has presented emphasizes, above all things, the need of a close knowledge of pathology as a basis for preventive treatment. He has impressed the fact that each one of us needs to have in our minds a picture of the full chain of the pathologic symptoms in each one of these two groups of diseases which he has presented; that every time we think of dental caries, we ought to think of the dental pulp; we ought to think of the positions of the horns of the pulp; we ought to think of the dangers of involvement of the pulp and of the danger of the periapical tissues.

If each of us should keep clearly in mind the relationship between a slight inflammation of the gingivae and the changes which take place in the peridental membrane and other investing tissues of the teeth, we would take better care of the gingivae. We could not help it.

To the man who believes that the majority of pus pockets along the sides of teeth can be induced to heal so that the tissue will reattach to the surface of the root, this paper offers little of interest. To the man who thinks it is safe practice to let patients go around with chronic alveolar abscesses, this paper should not appeal; but to the man who does appreciate the danger of pus pockets alongside the roots of teeth and who appreciates the danger of chronic alveolar abscess, which has been pointed out in the paper tonight, this paper should appeal strongly. We should have these pathologic pictures so firmly fixed in our minds that we would think of the whole chain every time we approach it at any link; and that being true, we would not be so inclined to base general rules of practice on individual results.

We need to study carefully the pathology of these diseases. We need to get together data on many, many cases in order to establish rational rules of practice. If you read a book on medicine, such as Osler's, what does he do in the presentation of those things which form the basis for his directions as to treatment? Take any given diease. He cites how many cases of that particular disease they have had in the Johns Hopkins Hospital, and he cites how many of these cases developed these symptoms and the other symptoms, and how many progressed this way and how many that way, and what was done for these various groups of cases and what the results were. He may cite thousands of cases there, and then he will cite thousands of cases in other hospitals recorded by other men until there are brought together many thouands of cases with treatments of various kinds, and from all these case histories it is possible to determine a rational treatment which can be best employed. That is what we must do in dentistry. We must know more of the relationship between these beginning things which Dr. Friesell has pointed out and their sequelae.

Statistics which were presented to this Society some years ago called attention to the fact that 95 per cent of all adules present areas of gingivitis, and there will be an average of about eight areas per mouth. By the way, there is one point upon which Dr. Friesell and the rest of us are not in agreement, and that is the way we pronounce the word gingiva. We pronounce it gin′-gi-va, and he pronounces it gin-gi′-va; whether he be right or we are, I am not certain.

Speaking of the number of inflammations which we see of the gingivae; there are certainly too many of these in the mouths of our patients, and we ought to do those things which the essayist has told us to do in order to clear them up. I have been especially interested in this one phase of prevention. For a good many years, in examining the mouths of my patients, I have made a definite record of each slight inflammation of the gingivae. I have made a record of what I have done to correct each area, and six months later or at any time afterwards, when the patient returns, I have checked up on the previous operations to see whether or not these inflammations are still there, and in the majority of cases they are not there.

What does all this mean so far as these slight inflammations are concerned? We find that about half are due to the fact that previous dental operations were not done quite as perfectly as they should have been. I, today, had a patient present with proximal decay in the mesial surface of a second bicuspid, and there was a disto-occlusal amagam filling in the first bicuspid that had never been polished. That filling caused decay in the mesial surface of the second bicuspid without any doubt, and the septal tissue was inflamed. Two more minutes added to that filling operation would, I think, have prevented the occurrence of that cavity. We see hundreds of cases in which there is either inflammation or actual destruction of the septal tissue because some one has not built the contact quite as he should. So we might go along and call attention to and emphasize the many little things which Dr. Friesell has presented. Those are the things which make up the practice of preventive dentistry.

I want to express my appreciation of the term "height of contour," which he has brought to us, the height of contour meaning a line which represents the gingival limit of the self cleansing area of the tooth. The occlusal surface of the tooth is cleaned in chewing food; the slopes of the axial surfaces are cleansed to the line of the height of contour; beyond they are not cleansed by the scouring of food. While that height of contour is a variable line around each different tooth, it helps us to keep more clearly in our minds the self cleaning area of the tooth. It may not have occurred to you that this line divides cavities of decay of the teeth into two groups. All of the pit and fissure cavities occur occlusally of this line, and all gingival third decays and all proximal decays occur to to the gingival of it.

There are two phases of preventive dentistry which Dr. Friesell did not mention, and I am going to take a moment to refer to these because, it seems to me, they are necessary to place before us the complete picture of preventive practice. We heard much a few years back of what might be accomplished by oral prophylaxis. We had a number of men, and have yet a smaller number, who lay more stress upon the value of oral prophylaxis than upon anything else in the practice of dentistry. I think the so-called oral prophylaxis treatment has now probably settled to pretty nearly the place in which it belongs; that the rational application of this treatment as applied to particular cases is one feature of preventive dentistry which should always be mentioned in a discussion of this subject. Along with that we should not forget that our title "doctor" means a teacher, and that we ought to be teaching hygiene of the mouth all the time we are practicing dentistry. We should not overlook an opportunity to instruct a patient how he should take better care of his mouth. Along with both of these we need better and more careful practice on the part of each of us in our daily work. We need those three things together, and we need to apply them differently according to the age of our patients. We should have in mind that during the childhood period we are concerned chiefly with dental caries and with involvment of the dental pulp; that we are not so much concerned as to the diseases of the peridental membrane until later in life.

I want to add another word to the thought to which he called our attention, namely, the fullness of the gingivae in early childhood and the gradual recession of the gingivae as age advances. I wonder to how many of us it has occurred that the beginning of proximal decays was simultaneous with the slight dropping down of the septal gingivae. We look on the gingiva on the buccal surface of a first molar at six years of age, and possibly it covers the gingival half of that surface. We look at the same gingiva when that individual has reached 21 years of age and there has occurred a normal recession until it covers much less than one-quarter or one-fifth of that buccal surface. With the dropping down of the buccal and lingual gingivae there occurs oftentimes a slight dropping down also of the septal gingivae, exposing just a little of the enamel to the gingival of the contact point, and it prepares the way for proximal decay. We should connect these beginning proximal decays with this little recession; we ought to keep this in mind in the application of oral prophylaxis and in our instructions to our patients in mouth hygiene. If we would prevent proximal decays in the mouths of susceptible individuals we should avoid injury to the septal gingivae. We should be careful in the use of strips, ligatures, and everything that goes into the inter-proximal space. We should instruct the patient to be careful in the use of toothpicks and ligatures.

If a man was drifting along down a river in a rowboat and he came within sight of some rapids, with a good many rocks, he would use good judgment if he pulled to the shore and walked down the bank to see how dangerous the rapids were and how much of a waterfall there might be; whether he could get through them safely or if he might take chances of getting killed at the other end. So with the peridental membrane, we may float along in the region of the gingivae and have a pleasant and easy time, although there may be a few rocks there in the way of inflammation, but we do not pay much attention to them. If we could get out and go around and get a better look at the things that happen to the peridental membrane a little later on, I think we would be more careful of the gingivae.

Dr. Wm. H. G. Logan:

The importance of the prevention of oral focal infections as suggested by Dr. Friesell is beginning to be widely recognized not only by the dental and medical professions but by the public as well. Yet my observation has led me to believe that many members of the dental profession during the past few years have in some cases been leaving diseased dental pulps in teeth, for fear they could not replace them with perfect root canal fillings; while in other instances, the diseased dental pulps have been left because the dentist had not kept in mind the cardinal symptoms of pulp disease which should have clearly indicated the removal of the pulps in question.

If the foregoing statement is correct, and I am of the opinion you will agree with me that it is, should we not include in the discussion of the prevention of oral focal infections the following two points? First, what are the diagnostic findings which indicate that the vitality of a pulp which has been the seat of disease can and cannot be retained?

A.—DIAGNOSTIC SYMPTOMS OF PULP INVOLVEMENTS THAT WILL WARRANT TREATMENT WITH THE IDEA IN VIEW THAT THIS PULP MAY LIVE.

I am not positive I can accurately answer this question, nor have I found in the writings of others a satisfactory statement that we can here use as a guide, therefore until more scientific proof has been presented my opinion as to when these pulps can be saved stands as here recorded. Pain, intermittent, the paroxysms lasting at the most from five to thirty minutes. Where the pain occurs irriation more than once or twice in twenty-four hours, I would not, with rare exceptions, endeavor to save the pulp, providing the time of this return of pain without known irritation is at night.
Sensitive to heat and cold, and pain not relieved by application of cold water. Pulp perfectly comfortable between periods of pain. Extreme irritation causing pronounced results with the paroxysms subsiding in five to thirty minutes without treatment. The patient may or may not be able to locate the offending tooth. Tooth not sore under pressure from an apical pericemental involvement that was caused by a disease spreading by continuity from the pulp. This pulp must be covered in its entirety with at least a thin layer of normal dentin.

B.—THE DIAGNOSTIC FINDINGS WHEN THE VITALITY OF THE PULP IN A PERMANENT TOOTH CANNOT BE SAVED.

I would not endeavor to save the vitality of a pulp extensively involved with passive hyperemia, extensive partial non-septic pulpitis, total non-septic pulpitis nor an infected pulp.

CARDINAL SYMPTOMS AND FINDINGS ACCOMPANYING THESE DISEASES THAT CONTRA-INDICATE THE EFFORT TO SAVE THE PULP'S VITALITY WHEN THE ROOT ENDS ARE FULLY FORMED.

1. All pulps exposed by dental caries should be considered infected, therefore removal is indicated in every instance.

2. When a pulp has been exposed by accident and the tissue injured, for example, by excavator or bur passing into the substance of the pulp tissue, the vitality of the pulp cannot be permanently retained.

3. Remove the dental pulp in those cases where carious dentin is found lying in contact with it.

4. When the paroxysms of pain become constant and occur with or without the application of a known irritant and are most pronounced at night, the prognosis of this pulp's vitality is hopeless.

5. When a tooth becomes sore under pressure as result of a periapical inflammation caused by the pulp disease spreading by continuity to the tissues beyond the root end, begin treatment that is to terminate in the filling of the root canal.

6. Every pulp should be removed when the pain is controlled by the application of cold water, however such a pulp may live for years in exceptional cases.

In the application of the above statements, let it be remembered they only have reference to pulp diseases in teeth that have reached full development.

Second, oral focal infections must not only be fought by the reestablishment of perfect contacts, but must be attacked by caring for children's teeth through prophylaxis, thereby preventing the retention of plaques which are attached to the teeth whenever we find dental caries beginning on normal smooth enamel. Since the dental profession as a body has done very little to keep dental caries from beginning by seeing the patients sufficiently frequent to accomplish this end, I have long since been led to believe that we will not be doing our duty as a profession in the management of this question of the prevention of oral focal infections until we bring about a change in our dental law to correspond with those now active in Connecticut and New York. Then it will be possible to employ dental nurses whose duty it will be to care for all exposed tooth surfaces for patients whose mouths are healthy. If this intelligent prophylactic treatment is done with sufficient frequency dental caries and many diseases of the supporting structure having their origin at the gingiva will be reduced.

I am well aware that many of our leading men disapprove of the dental nurse taking over this important work, but since dentists as a body have never seen fit to assume this responsibility is it not time they gain assistance of a nature that will make it not only possible for the children of the rich, but those in moderate circumstances, to pass through life with a greatly reduced number of oral focal infections resulting from the neglect of preventing the origin of diseases of the gingiva and dental caries in so far as it can be controlled with our present knowledge of prophylaxis.

To speak of the need of a new dental law in this State and not urge our members who are qualified to take up the question of the advisability of securing this legal enactment would be to lose time, therefore, in closing I desire to pledge my support to any man or group of men who are willing to do the work necessary to have our dental law changed to the end that dental nurses under the proper safeguard may be employed by any licensed practitioner of dentistry who desires their efficient services.

Dr. Frederick B. Noyes:

I want to express my appreciation of the excellent paper which has been presented to us. Like some of the things that have been presented to the country, it tells us what preparedness will do. The essayist has reviewed a plan which, if carried out, would prevent the conditions which are attracting the attention of the dental and medical professions more than any other things today. If the program presented by the essayist could be in a thorough manner executed, there would be very few foci of infection for those who receive dental treatment. I think that we should remembmer that the conditions which confront us as a profession today have been brought to us rather unexpectedly. They have been a surprise to everyone. They are not even fully recognized by a good many at the present time, and simply as endorsing the plans of prevention presented by the essayist. I am going to say just a word or two about the things which he wishes to prevent, for, as Dr. Black has said in his discussion, the man who believes that patients may go about with oral abscesses and pockets exuding pus along the sides of the teeth without any danger, would not get very much out of this paper; in fact, this paper means nothing to him. A noted physician said not long ago that from the cradle to the grave every organism was in a constant combat with infection, a fight which in the end infection wins. Thinking for a few minutes of that statement, what rational man would harbor in his own organism retreats, safe recesses capable of sheltering indefinitely, year after year, millions of the enemy ready to become offensive at any moment. The fact that they are not effective for years at a time does not mitigate the danger. The fact that men have lived 50 years with alveolar abscesses and have died of other pathologic conditions not related to them, does not mitigate the danger, and I want to say that perhaps we are inclined to think only of pus and pus pockets and pus cavities as foci of infection.

The more I study these tissues in their pathology, the more I begin to realize that the most dangerous foci from the standpoint of systemic infection, it seems to me, are often foci which have no pus at all. We must remember that a tissue may be filled with microorganisms; it is an infected area, and still there may be no destruction which produces pus. There is in that area perhaps only granulation tissue being broken down and rebuilt in a condition in which the access of the micro-organisms to the blood circulation has its best chance for a pus area is always more or less perfectly walled off.

Following the idea of the essayist in those cases where methods have failed or the opportunity came too late, I want only to emphasize the fact that the resistance, not only the general systemic resistance, but the local tissue resistance, are factors and most important factors in the problems of infection, and I would make a plea for the use of those methods which do not lower the resistance of the tissue to infection. That is most applicable in connection with all of the treatments of the dental pulp. It is applicable also to the treatment of all those conditions which exist about the peridental membrane, but it applies primarily with reference to the pulp. I believe that if it is true, and probably it is true, that a very large proportion of the teeth, from which pulps have been removed and the roots filled even by the most careful operators, have areas of infection about their apices; that that condition is the result of the lowering of the vitality of the tissues about the apex or periapical tissues as the result of the methods employed in treatment; that in at least a considerable proportion of these cases the infection present was not necessarily introduced through the root canal or through continuity of tissue, but that conditions were established in the periapical region which made the tissues in that region a prey to the first systemic infection, and when you study the tissues of somewhat similar character in the body, which are a prey to systemic infections, the tissues attacked in rheumatism, we know that their one of the most important factors in the liability of attack is the reduction of tissue resistance, and so it is in the periapical region. That tissue is attacked, it becomes a prey to infection because of the lowered vitality induced by the means of treatment.

In the last year or two I have had occasion to be more deeply impressed with the character of conditions in infections of the peridental membrane and gingival tissues, and in thinking of those conditions most of the men—I would say all of the men—who have studied carefully, thoughtfully, the pathology of those tissues have realized that one of the factors in the condition in every case was a lowered tissue resistance. The fact was pointed out and emphasized by Romer that during the period of vigor, during the period of bone growth, during the period of increase of tissue, during the process of development these tissues are not subject to infection. It is not until there is a lowering of that tissue energy which comes with the completion of structive function that they become subject to and a prey to the infection, and with that general condition established anything which locally lowers resistance becomes a factor in the beginning and in the spreading and in the destructiveness of the infection to the tissue involved, and as we examine the tissue changes in that process, we become more and more impressed with the fact that inflammation itself progressively lowers the resistance of the tissue in advance of itself. That can only be explained by the general statement that the inflammatory process follows the lymphatic courses, the perivascular lymphatics. It follows consequently infections of the walls of the blood vessels, establishing a condition of arteritis, and that process itself reduces the nourishment of the tissues involved and increases a lowering of their resistance.

With Dr. Black, I want to add what emphasis I can to a plea for the study of the pathology of these tissues, for not until the time comes when we have a clearer conception, first, of the normal structure, then of the changes which occur in that normal structure with the progress of disease, will we begin to have any basis for argument as to what may happen in the way of return to normal after a pathologic condition has been established, and all of these conditions together become the background and a plea for the subjects presented by the essayist in the establishment by the whole profession of those principles of practice which will in the end, if not entirely, largely eliminate the foci of infection.

Dr. H. E. Friesell, Pittsburgh (closing):

Naturally I did not expect from the members of the Chicago Dental Society much adverse discussion of the ideas presented in the paper. The same ideas if advocated in certain sections of the country, however, would have produced a small sized revolution.

Dr. Black referred to the fact that we have an idea in the middle west that eastern practitioners of dentistry are all hardheaded. The trouble is that some of the rest of us are hard-headed, too, and often when we meet the sparks fly. But, nevertheless, while the introduction of western methods has meant hard work, it has been lots of fun, and we are accomplishing much good. I cannot tell you how much we owe to the members of the Chicago Dental Society for the invaluable things they have taught us and are teaching the rest of the world in dentistry. You have here many eminent men whom you think you fully appreciate, but you see them every day and have always enjoyed their teachings, and for that very reason you are not in a position fully to realize how much the teachings of these men have meant to dentistry and indirectly to each of us. Let us take men like Dr. Black, Dr. Gilmer, Drs. Edmund and Fred Noyes, Drs. Logan, Buckley, Goslee, Brophy, Taggart, Moorehead and others I might mention: they are men who have made and are making dentistry. You could not appreciate them as much as we do, simply because you are brought in contact with them every day.

To attempt to teach men that they are wrong in their methods of work, and that they must study harder and more diligently; to require them to change their ideas and study certain things over again, is a difficult proposition. I speak from experience, for I have traveled that road. The first time I heard or read of some of the propositions of Dr. Black I was very much opposed to them, because I realized that if the statements made by him were true, I knew a lot of things that were not so. The trouble with most of us is that when we get to the point where we think we are right, and the other fellow is all wrong, we are satisfied to let it go at that. But our hard-headedness demanded a little further investigation. Some of the things that we felt quite certain were wrong in western dentistry, upon investigation, to our amazement proved to be actually true; then we began to find out that a lot of our accepted ideas were false; and our whole conception of things needed revising. However, we are very glad for having had that experience, because it enables us to know the situation in both sections of the country, and the western man who does not know anything about eastern dentistry is not in a position to comprehend the situation as it exists in the east. One who understands both schools of dentistry—because there really are two schools of dentistry in America—can go almost any place in the east and put his finger, without any trouble at all, upon some very sensitive spots in the profession.

Dr. Black's questioning of the pronunciation of the word gin-gī-va reminds me of a little squabble we had some time ago along a similar line. He contended that something was "nee-ther this nor that," and I said it was "nī-ther this nor that," so we referred the matter to Dr. Gallie, who declared it was "na-ther this nor that." (Laughter.)

One of the most important of our textbooks is a dictionary, and if you consult a dictionary you will find it always interesting. When you get the dictionary habit you will discover many things that will astonish you. It will demonstrate to you how little English you know, and that is one reason why I can speak rather confidently about the matter. I do not believe that you know very much more about it than I do unless you have been reading a dictionary recently. It is the consensus of opinion as expressed in the majority of dictionaries that we pronounce the substantive singular gin-gī-va; plural gin-gī-vee, and the adjective gin′-gi-val. I am not certain about the adverb. We would also use the term gingivītis. Dr. Black, if he searches carefully, may be able to pick up a dictionary that will bear him out in what he claims. I have a friend who frequently differs with me in pronunciation, and when I occasionally sustain my claim by reference to the dictionary, he replies, "You should get my dictionary." (Laughter.)

ILLINOIS STATE DENTAL SOCIETY, FIFTY-THIRD ANNUAL MEETING HELD AT QUINCY, MAY 8, 9, 10, 11, 1917.

DISCUSSION ON PRESIDENT WHIPPLE'S ADDRESS.

(This address was published in the June Number of the DENTAL REVIEW.)

DR. C. N. JOHNSON, Chicago:

Mr. President, Ladies and Gentlemen: It is a great pleasure to be called upon to open the discussion on this most excellent address of our President. I congratulate the Society on having a President of this caliber to look after the interests of the Society through the year and at this annual session.

In regard to the recommendations of the President, I will refer briefly to a few of them. His recommendation to appoint a committee to discuss the President's Address has been in vogue, I know, in many of our state organizations. They have a committee appointed for that special purpose, to take the President's Address, to deliberate upon it, and then later in the session bring those recommendations before the general body. It seems to me, that the recommendations made by the President in his address would be much better canvassed and considered if that were done. I should favor the appointment of a committee of that kind.

The question in regard to curtailing expenses is an important one for us at this particular time.

As to the matter of raising the dues to meet these emergencies, it seems to me that the dues have been progressively raised and raised until we are very near the danger point. In that connection, I feel that while we must meet the present emergency, it is not likely in a number of years that we will have so many unusual and large expenditures as we have had in the last year. So I believe we must be very careful how we husband the membership in the different parts of the state among the component societies. I believe if we are to raise the dues it can be done and should be done very gradually with the idea not of excluding any one at all, but making it easy enough for him to become a member and remain a member of this Society.

As to the issuing of the Bulletin, if there is any appreciable saving in the expense I would favor issuing the Bulletin bi-monthly, but I want to say, I have a very high notion of the value of that Bulletin reaching the membership. If there is not much saving I should favor it coming out monthly, although it entails additional work upon the Secretary, who is the Editor. But I know our present Secretary is very glad indeed to devote himself to the interests of the Society, and here I want to pause long enough to pay a compliment to our present Secretary, who has fulfilled his duties in the most loyal, faithful and efficient manner, and I believe he is entitled to the thanks of the Society. (Applause.) If there is not much saving, I should favor the Bulletin coming out monthly. It keeps the membership keenly in touch with the interests of the organization. We need literature today to keep us in touch with our fellowmen, and whenever the Bulletin comes in to the office I pick it up because I must see it, and I think most of the membership feel the same about it.

As to the increase in the price of the bound Transactions, I should advise the payment of one dollar a year for these Transactions. They are worth it to any man, and I do not believe any member of the Society would ever complain about a charge of one dollar a year. That publication has been issued at some expense to the Society. That should not be. Our members should pay individually for the issue of these bound Transactions. We should stop to consider the amount of work put in by the Editor of the Society, Dr. Edmund Noyes, and, by the way, I would like to pay a tribute to that splendid man as Editor of the Transactions of the Illinois State Dental Society. I have occasion to know something about the labor he puts in the work, but you men who pick up the Transactions and read them have little idea of the work behind the issue of that publication, and I am sure when this is made known to the membership there is no member who would not be willing to pay a dollar instead of fifty cents for the Transactions.

I was much pleased with the President's reference to the component societies and the splendid work which they are doing. The virility of this parent organization is due entirely to the activities of the component societies, and I am glad that the President has made it possible to keep the component societies in close touch with the official family of the state society. I believe that presidents should do this; that they should foster very carefully the sentiment and spirit of the component societies. It is encouraging to hear his report upon them. I hope it will be an intimation for coming presidents to take it upon themselves to keep in the closest possible touch with these organizations.

As to the Preparedness League of American Dentists, I second the recommendation of the President, that every one of us as a body and as individuals should support this organization. The time has come when the dental profession is to be placed on trial in regard to its relationship to community, state and national interests, and this Preparedness League has been organized along the correct line, and if we support it loyally, as I believe we will, we shall make an impression upon the military authorities and upon the naval authorities that no other kind of effort will do. We should accept whatever responsibility of this kind which may come to us at this particular time.

I am going to read an extract from an editorial published in a magazine called "Salesmanship," to which my attention was called by a gentleman the other day in regard to this very thing. I believe it is a significant statement, and the editorial is taken from the May number (1917) of the *Salesmanship Magazine.* "We do not know when we are making ourselves strong, rich and great in resource and character. The world pours its force into us when we put ourselves in right relation to it; experience makes us constantly wiser if we know how to rationalize it; time deposits all manner of treasure in our memory and imagination if we hold the doors open. Nothing is lost on a man who is bent on growth; nothing is wasted on one who is always preparing for his work and is alive by keeping eyes, mind and heart open to nature, men, books, experience. Such a man finds ministers to his education on all sides; everything cooperates with his passion for growth. And what he gathers serves him at unexpected moments in unforeseen ways. All things that he has seen, heard, known and felt come to his aid in a critical moment to make his thought clear and sweet, his illustrations luminous, his speech eloquent and inspiring."

It impressed me that this sentiment in this editorial fitted very nicely into the present situation regarding the dental profession. In other words, we will be able to deliver goods to the community and to the nation just in proportion as we have prepared ourselves mentally and physically for that purpose. We have not thought seriously enough upon this.

A year ago, in the discussion of the President's Address on this floor, I lamented the fact that there seemed to be at that time in the mental attitude of the America people a frivolity that I deplored. I felt the American people up till then did not realize the full significance of the terrible situation the world was in. We were sitting aside and looking on, and not looking too keenly at that. Today, while I abhor war as much as any man, I want to say I am more hopeful of the future of this country in mentality, in physical being, and in character than I was a year ago. (Applause.) I believe in our intent and purpose to take our place side by side with the great nations of the world we are only coming into our own, and while some men have said that this is not our fight, I want to tell you that there is a principle involved there that is fundamental and eternal, and which is well worth fighting for by any nation. Let us hope that when the present conflict is over the United States may hold its head high among the nations of the world, and that the peoples of all countries may understand each other better than they do today —to the end that there may be ushered in the dawning of an eternal peace.

Dr. Arthur D. Black, Chicago:

The address to which we have listened today is much the type of address we would expect from a man of the type of our President. So far as the conduct of the Society is concerned, we would expect to get from him suggestions of a practical nature along the lines of society conduct. It is in those features, it seems to me, the address can be discussed very profitably before the entire assembly, and there should be the adoption of one of its suggestions in order to have it handled properly; that is, it should be discussed and considered by a committee which should present a report, because to adopt any one of the suggestions made for the curtailment of the expenses of this Society involves the consideration of other financial matters, and of other professional matters, which I think it is not possible for one simply offhand to grasp altogether. There is one thought in this connection which is in my mind, however, as applied to this whole situation, and that is the one which was referred to by Dr. C. N. Johnson that in the plan under which this Society is now working, that of the component societies which make up the society as a whole, we must never overlook the fact that the prosperity of this Society from every viewpoint, with the scientific viewpoint uppermost, depends to a large extent upon the help of the component organizations, so that in everything we do it seems to me we should have in our minds the thought of the effect any particular thing will have upon a component society.

As I have looked over the progress of the Society since it was reorganized, there have been in my mind certain things which, while I may be wrong, I always hold in my mind as those which have been the greatest stimulus to the continued progress of the component societies. First, among all of those, I would place our monthly Bulletin because that bulletin is the one thing which gives us, at a comparatively small expense, the opportunity to keep all of the members in the various component societies in touch with what is going on in this Society of itself and what is going on in the various other component organiations. If one would take copies of the Bulletin for a number of years and would note certain things, for instance, that you may find in a certain monthly issue, the first occasion on which one of the component societies extended an invitation to its next neighbor to come over and meet with them and have dinner with them, you will notice in the bulletins of a few succeeding months a good many societies will have done the same thing, which means that the Bulletin has carried that new idea in promoting good fellowship and society action from the one organization to the many others, and so you will find with almost any other new thing that the component society itself does. It will stimulate the other component societies to the thought that they ought to do something; that they ought to initiate some things that the other societies have not thought of. It promotes more or less of a pleasant and profitable rivalry between the various component societies. The Bulletin is now published nine times a year, and to make it a bi-monthly would mean four or five issues a year. I cannot see where any great saving in expense would be in this. It would cost just as much for mailing purposes to issue it bi-monthly and it would mean more pages, and I question whether the curtailment of expense in connection with that would be justified.

There is one other item I wish to refer to and to take exception to the recommendation of the President, but in so doing I would not have you think that I am not in favor of his recommendation for curtailment of expenses as a whole. I would question the advisability of discontinuing the plan of sending and paying the expenses of some one to visit the component societies and present matters of interest to them. This is an item of $150 or $250 a year in the budget of the Society and, it seems to me, there are many times when the various component societies need this stimulation, and they of themselves are hardly able to pay the expenses of having a man come to address them, and certainly that man ought not to pay his own expenses. Every society, I presume, goes through periods of greater and lesser activity as the years pass. This Society is no different in that from others. Whether I am right or wrong, I have felt the membership as a whole in this Society has not in the last two or three years taken quite as much active interest in the work of the organization as it ought to take. I would note the fact, especially we will say, from our Chicago contingent at this meeting. There are among the Chicago men here very few new members of the Society. I question whether the Chicago Society—and I take this home to our own organization rather than possibly apply it to the state as a whole—has done the things which it ought to have done to stimulate the younger members to take an interest in society work which they ought to be taking today and which they are not taking. The same thing is reflected here. We see the same men in this audience almost entirely this year and last year, and a great many years back. There is something we have not been doing which ought to be done, it seems to me, to enthuse the younger men in the work of the organization. This has no reference, I am sure, to the matter of expense, but it is simply one of those things that happen, and I am not criticizing any officer or anybody in connection with the Society. I do not question the enthusiasm and the work the officers have done and are doing; it is a question of the future as to how we can look into this thing to stimulate a greater interest in the other component societies and in the state society itslf.

As to the opportunity which is before the dental profession in connection with the entry of this country into this world war, I think we might do well to look at what has been done by the dentists not only of our own country, but the dentists of France and of England, and possibly more especially those of Canada. In Canada there was no dental organization in connection with the army service, if I am informed correctly, at the time of the opening of the war; yet if we walk into any base hospital in France today we find ample recognition of the wonderful work which dentists have done, not only the dentists of Canada but those of France and England and a few of the United States. On account of the peculiar nature of trench warfare, an opportunity is offered here to the dental profession to do wonderful work—an opportunity such as seldom comes to a profession. If the dental profession of this country will realize what has already been done for the armies of the other countries and will realize the opportunity which we have to do wonderful service for our own men, I am sure we will not be slow to seize it. We have not only to realize this thing ourselves, but we have to bring those men in Washington who are to direct these things to realize it, and that may possibly be a difficult thing to do because of the fact they are so much engaged with many other things which seem to them to be more important.

I have had the opportunity personally during the past few weeks to see the mouths of a number of newly recruited men and you do not have to see very many to appreciate the opportunity which dentistry has. Through the Preparedness League, or through any plan which may be developed by which the dentists themselves and by which the dental schools may put the mouths of men in good condition before they go to the front, we will be able to render a most wonderful and valuable service. It will relieve these men of tremendous suffering and put them in such a condition that they will be less endangered by the injuries which many of them must necessarily receive and suffer from. I cannot speak too strongly on this and would urge our dentists to study this problem and be ready to take their part in the work. (Applause.)

DR. GEORGE D. SITHERWOOD, Bloomington:

I rise to commend the excellent address of our President.

I am glad of the opportunity to have been present to hear it.

With reference to the Bulletin, I think we ought to have it at least once a month. It is considered a great and valuable paper among the members of the component societies.

With reference to raising the dues, as a member of a component society I am not so sure about that. I wish that the dues might remain nearly the same for the time being. We are contemplating, in the component society of which I am a member, having three or four new recruits as members of that society. I am sure, to raise the dues would somewhat interfere with having them come in.

With reference to the matter of paying some one to address the component societies, I think that should be left to the component societies. In our society we have enough money in the Treasury at the present time to pay a sufficient sum to get some component man to come and address us at our next meeting, and we have a committee that is making arrangements for the purpose at this time. So I think, instead of the state society paying anything, the component society should use its own money for that purpose.

Dr. William H. G. Logan, Chicago:

There are two questions I would like to speak on, the first is the question of dues. I believe our society should raise the dues one dollar. Other states have done it or are contemplating doing so. Illinois has hung behind a number of years for fear that if the dues were raised some would drop out. Last week I was in Des Moines, Iowa, and they raised the dues from six to ten dollars; three dollars for the local society, three dollars for the State society, three dollars for the National , divided two for the National and one for the research; the other dollar to establish a sinking fund to pay expenses of a committee to investigate a method or manner whereby members of their society should be protected legally against malpractice suits quite the same as the medical profession are cared for in this State. I believe that we should raise our dues one dollar for the research fund, and I sincerely hope this society will raise them by unanimous consent when this question comes up. As an organization this State is behind some of the others in supporting the research fund. We cannot afford that, as I see it. I have been a little backward until now about recommending it for fear we might lose too many members. But, as a matter of fact, we raised the dues one dollar last year and the Secretary informed me a month ago we were a little ahead in membership at that time over the preceding year in spite of the fact that we raised the dues one dollar. So I believe we can with safety increase the dues for the research fund.

I believe the bulletin, as suggested by some of the discussors, should be continued monthly instead of bi-monthly as recommended. I believe, as Dr. Black said, the Bulletin is a publication we need every month. The officers and workers of the society read these Bulletins, and the fact that many of the members do not is not proof that it is not an efficient organ.

Let me say a word or two about the war problem. The Army needs 2,000 dentists in the Officers' Reserve Corps. They need them now. They will get them by men coming in voluntarily or by conscription. We hope the greatest number of these practitioners will join voluntarily from the graduates of 1917. A man can go direct from school through the regular routine of examination and become commissioned first lieutenant and receive $2,000 a year salary. That examination is to be held by two Army dentists; it cannot be held any other way at the present time. The examination is conducted by two Army dentists and one medical man appointed by the Army for the physical examination.

A proposition was presented to the Surgeon General last Monday by Dr. Kirk in the presence of the speaker to have a committee appointed in each school composed of two dental teachers, and these men to be commissioned for the purpose of holding these examinations, said men not to be subject to call for other active duties. His reply was, "Do not have your dental teachers commissioned unless you are willing to take the chance of their being called for service for the duration of the war." Therefore, it is not thought wise for medical or dental teachers to join the Officers' Reserve Corps because it is better for the medical and dental schools to keep open and be undisturbed that the Army and Navy can be supplied annually with physicians and dentists.

One unfortunate thing in relation to the Dental Corps in the Army at the present time is that a dentist cannot be accepted above the rank of lieutenant. There is a bill in the hands of the Legislative Committee, of which the speaker is chairman, giving to the dentist similar rank and pay now granted those in the Medical Corps. If the medical men need a change in their law there is a possibility of the presentation of our amendments going through with any medical legislation that may be passed by the present Congress.

Dr. Donald M. Gallie, Chicago:

I do not desire to prolong the discussion of this splendid address. It pleases me very much to know that we have a man as President who not only looks on the scientific side but the business management of the Society very seriously. I wish to sound a note of warning at this time with regard to the curtailment of expenditure, and I also want to say, I do not believe it is best to practice or to advocate economy along certain lines. I certainly believe we would make a mistake if we start at this time to discourage raising the dues for the next year. When you stop and think what the members of this Society get for six dollars and what is being done for the national organization, the state and local organizations; when you think of the splendid journals we are getting, the *National Dental Journal* and the DENTAL REVIEW, there should be no quibbling at all about the question of raising the dues one dollar.

As a member of the Research Commission of the National Dental Association and as Chairman of the Committee of this organization for the Chicago Dental Society, I have some reason to speak feelingly on this subject. It has been my privilege in the past two years to visit state societies, and while you and I believe that this Society has been one of the foremost state dental societies, we are told that we are falling back every year. If we expect to keep in the vanguard, we must take interest in and support the great institutions that are doing so much today for the advancement of dentistry. There is no institution that is trying harder to put dentistry on the map than the Research Institute of the National Dental Association, and personally I am in favor of raising the dues. Something like 20 or 30 states have already raised their dues a dollar for this purpose. Iowa raised its dues from $6 to $10, and Illinois cannot afford not to increase its dues. There is no class of dentists more successful than those of Illinois. No class of dentists are listened to more repectfully and attentively when they address other state societies than the members of this organization, and there should be no question at all about taking on this extra load. This is the time to do it because in the next few years possibly we will have extra loads to carry. Money contributed toward the Research Institute of the National Dental Association will be used in the right direction to help the profession as a whole, and I hope every man here will be a missionary and use his influence and his efforts to raise the dues of the Society in order to keep up the splendid work we have already started. (Applause.)

Dr. J. G. Reid, Chicago:

I have only a word or two to say in commendation of the President's address. We have heard with great fervor an appeal for an increase of funds in this Society. A dollar is not very much, and yet a dollar accomplishes a great deal if everybody contributed it. Let me offer as an illustration this: the publication of our Transactions is apparently an encumbrance. I think it costs in the neighborhood of $900 to publish the bound Transactions, and there are only 400 members in this state society that have issued to them these bound volumes. There are 900 or 1,000 members that do not pay anything in at all. Of course, this makes a drain upon the funds of the Society for 400 members only to have this published, because the smaller the number, the more money it costs; relatively speaking.

As to the issuing of the *Bulletin,* I want to say this, that I take great interest in the issue of this *Bulletin.* I look forward to it with considerable interest every month, and I should dislike very much to see it discontinued or made a bi-monthly publication. If you will observe from the earliest issue of the *Bulletin* after the reorganization down to the present time, you cannot fail to see that there has been a very great improvement from year to year. We seem to have been fortunate in getting some one each year to take care of the *Bulletin.* It has been well edited. It will demand a little more time from its editor as we go on, but it seems to me we cannot afford to discontinue the issue of the *Bulletin* regularly as it is now.

From my standpoint, I wish to commend the excellent and faithful work of our Secretary, Dr. Luthringer. I have a letter at my house at present that I started to write to him last February congratulating him on his excellent work. That letter is about half written and it is lying in a drawer in my desk. In that letter I told him what a great pleasure it was to me to read the *Bulletin* and how much work he had been doing to make the *Bulletin* interesting and profitable to the members. Now, I have a chance to say this, I will not have to finish this letter.

It seems to me, from what I can glean from the literature that comes to me monthly as to what the other state societies are doing, we are not doing as much as we should. We certainly ought to wake up. We have carried honors for a long time and we should not let them slip. Let us keep in advance, and if a dollar a year will do that it is mighty cheap. Let us have it.

Dr. William H. G. Logan, Chicago:

After the remarks of Dr. Reid I want to say this: When any of these other states hold a great meeting, if they can get men from Illinois they are very proud of it. You go into any state other than Illinois, and if they get men from this state and put them on the program they know they are good drawing cards. This Society is not sleeping, but its members are in the habit of doing a lot of scolding among themselves, and that is a good thing. I have had occasion to be present at other state meetings when some of our men have been on the program to read papers and to discuss them, and when you read the Transactions of the other state societies you will find that quite a few of our men have been there to help to make them. (Applause.)

Dr. C. M. Meade, Carmi:

I wish to congratulate our President on his excellent address. In a small way, at least, I have been in touch with our local work in southern Illinois for 22 years, and I hope and pray for southern Illinois that we do not curtail the expenses from the standpoint of taking away the brains of this Society from coming to our local society. I want to tell you that I know whereof I speak. I speak the sentiments of our members, and I speak for the laymen. We had the honor and great pleasure a few years ago of listening to Dr. C. N. Johnson, who came to our little town, and through his ability and generosity, and through the aid of the state society in sending him there, he did more for the uplift of that community than anything else could possibly do, aside from the great benefit that we as dentists received from his talk. I do not hesitate to say that Dr. Johnson did more for the uplift of that community than anything else has done in the history of Carmi because the laity have come to me and told me so. (Applause.)

President Whipple (closing):

It is not my intention to answer all of the points that have been brought out in this discussion, but I am going to say a word or two. I have looked at this subject of finances absolutely from a business standpoint, and there is no sentiment in it at all. The Society has got to raise its dues or it has got to curtail its expenses. You can take your choice. We have been paying out of the state treasury, as I intimated in my address, about $700 a year to the National Association which we should not be called upon to do. The local societies should pay that 50 cents that we agreed to pay for one year and have been doing it ever since; then, if you raise your dues for the research fund, you have got to just about where you ought to be. If you do not raise the dues, you must curtail the expenses. That is all I have to say in response.

KENWOOD BRANCH OF THE CHICAGO DENTAL SOCIETY, APRIL, 3, 1917.

DISCUSSION OF DR. J. P. CARMICHAEL'S PAPER.

Dr. F. H. Skinner:

I feel it a privilege to be present this evening and highly honored, my dear President, to be chosen by you to open the discussion on this paper. I was favored with a copy of the paper, and have read it through with the greatest of interest. As we all know, this is a topic to which Dr. Carmichael has devoted a great deal of attention and the principles of dental prophylaxis, as set forth by him, are worthy of our attention.

We are aware of the fact that inflammatory conditions arise from microbic activity, and where there is an inflammatory condition, we find abnormal secretions which will gather organic matter favoring fermentation and bacterial growth.

Children who indulge in sweet foods and candies, have bad teeth. If the ingredients contained in tooth pastes are only adding "fuel to the flame," then, of course, they should be discarded. The most important thing, to my mind, in maintaining a healthful condition of the mouth, is the proper mastication of coarse food; this makes for sound teeth and firm gums. It is important that we choose well, in advising our patients, and discriminate whether we are prescribing for a normal or pathological condition.

Dr. Carmichael mentions specifically that the formula he is advocating is one to be used in maintaining a normal, healthy condition of the teeth and gums, such as would be recommended for use by children, young and middle aged people with good teeth, and those patients whose gums have been treated, and who wish to maintain that normal standard.

I very heartily endorse what the Doctor has said, and I wish to congratulate the speaker.

Dr. Dunlop:

I was intending to leave for New York immediately upon the close of my class work, two days ago, but an invitation from your President, to be present this evening, was sufficient inducement to hold me over.

The practice of my specialty has thrown me in very close association with Dr. Carmichael, and I am very familiar with his ability and capacity as a dentist. We are all familiar with the methods that have been advanced and demonstrated to the profession by him.

He was a staunch supporter of the advocacy of pulp preservation—and when he introduced what is known as the Carmichael attachment for bridge work, that was one of the strong arguments for its adoption—and this was some twenty years ago. Had all dentists seen the importance of this at that time, how much it would have meant to the human family—not only of preservation of teeth, but maintaining bodily health.

I am a thorough believer in his principles of prophylaxis. I have been prescribing his Pyorrhea Powder Formula extensively for a number of years. I hope the formula that he has presented to us this evening for family use will prove equally as good for the purpose for which it is applied.

I am interested greatly in what he had to say regarding the taping of the teeth. In this regard I think he was a little too modest in his presentation. We cannot expect the gum to heal as long as deposits and putrescent matter remain between the teeth. At this point nearly all dental diseases have origin. I know of no other method by which we can maintain a clean, sterile neck of a tooth, other than by taping regularly. This, of course, should be conducted in a manner so as not to injure or retard the healing process.

Dr. H. M. Heggland:

Miss President, Dr. Carmichael, and Members:

I appreciate very much the opportunity of listening to Dr. Carmichael's most excellent and valuable paper tonight, and the discussion thereof, as the subject is one of such vital importance, both to the dentist and his patients.

I fully agree with what Dr. Carmichael, Dr. Skinner, Dr. Dunlop and others have said; but there is one thing that, I believe, should have been emphasized more strongly in the paper, and it is probably due to Dr. Carmichael's modesty that it has not been done, and that is a shout of warning and earnest appeal to some of our brother dentists to be more particular about the way in which they clean their patients' teeth, for only too often are they gone over in a most slipshod and careless way. And if the dentist does not care a great deal about whether he cleans the teeth well or not, how can he be expected to either show his patients or urge on them the necessity of keeping their teeth clean?

I have often heard dentists say they do not care to clean teeth, and if they have to do it, they will often use nothing but a sandpaper disk and in a few seconds or minutes run over the most exposed surfaces, while the other and most important parts of the teeth are not even looked at; meanwhile, the patients are under the impression they have had their teeth cleaned.

To me this looks like a crime.

Only a few days ago there came to my office a man who had gone to a dentist every six weeks to have his teeth cleaned, and I am sure any man here, if they had seen them, would have said they had not been cleaned for a year.

It is when one sees these things time and again that one feels the necessity of "shouting" the warning to "turn from the evil ways," to abolish this criminal practice and much rather not do anything at all in this line than to deceive both themselves and their patients. And the sooner we change this method the better for us all!

Dr. W. F. Whalen:

Dr. Carmichael has given us a splendid, practical and timely paper on Mouth Health. His work for years along this line entitles him to be called a master in matters pertaining to mouth hygiene.

The Doctor's paper is filled with many old theories brought up to date, as well as many new and very practical suggestions and methods which the dental profession would do well to consider seriously, also adopt, but the one which appeals to me the most and to which I will endeavor to confine my remarks is that of the education of our patients and the public at large.

I find myself in hearty accord with Dr. Carmichael upon the most effective way to wage a campaign of education on mouth hygiene.

Having given this subject very much thought and study, as well as several years' work in the free dental infirmaries of Peoria, I am prepared to say that the greatest possible good can come through efforts along these lines by conducting school clinics, having tooth brush drills, giving lectures, illustrated and otherwise, in all the grade schools.

The laws of the land compel the children's attendance at school, therefore, that is the place to bring this form of education, as well as all others, to them. As the Doctor has well stated, these are the most impressionable years, as well as those when the teeth need careful watching and attention.

Some advocate lectures to parents. While there is no question that they need the advice, nevertheless, your sphere of usefulness is necessarily limited because of the difficulty of getting adults to meetings and keeping them interested.

You have heard it said that you can not run the mill with the water that has passed. My application is that if we ever hope to make any considerable progress in our propaganda of mouth hygiene we must make converts who will stay "put" and who will later become evangelists in our cause, going into the world as our future mothers and fathers and spreading the gospel of the clean mouth to generations yet to come.

When we have inculcated into the minds of our children habits of mouth hygiene we have builded well, but it does not end there. The work is everlasting, much as the promulgation of the gospel of salvation, must be kept up continually, lest those saved eventually fall from grace and the structure, figuratively, fall into disuse and decay.

Permit me to offer a few suggestions based upon personal experience. Every dentist should become active in the establishment of free school dental clinics for the poor children, donating his services until such time as the school authorities will take over and employ salaried interns.

DR. GEORGE T. BANZET:

Madame President, and Fellow Members of the Kenwood Dental Society:

It has been a great pleasure to listen to a paper upon the subject of mouth health which shows the care and study that has been devoted to this paper.

Those of us who have been in the pyorrhea and pryphylactic field know of the terrible evils of foci of infection existing within the mouth, causing, as they do, almost every systemic condition which may exist. We know that rheumatism, arthritis, endo-carditis, myo-carditis, kidney affections, and other conditions too numerous to mention are caused by pyorrhea or apical abscess, and we also know that those troubles rapidly disappear when the condition in the mouth improves, and it should be a stiumlus to us to employ every means to educate our patients to the necessity and value of mouth sanitation.

In this connection it will be of the utmost value to have a dentifrice which will combine the essentials as outlined by Dr. Prinz. Dr. Carmichael has had extensive experience along this line, and when he recommends a formula we may feel safe in giving it to our patients.

The essayist has mentioned oxygen vapor as a diagnostic and I am sorry that he did not tell you more about it, as it is the most valuable agent which we have in the treatment of pyorrhea, and only by its use can immunity be absolutely established.

Dr. Dewey:

Members of the Kenwood Society: In being asked to discuss a paper which deals with oral prophylaxis is like being asked to discuss something about which you have only heard. Never having been a practitioner of oral prophylaxis, but having given more or less study to the subject of the dental apparatus from both the medical and dental standpoint, and being familiar with the dental literature upon the subject, I may be able to add something which will be of more or less interest to you.

There are a great many things in the paper which we have just listened to, some of which I can agree with and some which I cannot agree with. There are a great many statements to make in regard to infection, the manner in which it may travel from the teeth to the tonsils or from the tonsils to the teeth, that is still a more or less disputed point.

I surely agree with the author when he states that the dental profession should be more or less familiar with the tooth pastes and oral preparations which are used in the mouth, and the great many pastes which are on the market are of very little value and probably deleterious. It is an amusing thing to me that the dental profession will accept a large number of samples of tooth paste and powders which are sent to them by manufacturers, that they will prescribe these tooth pastes and powders without any consideration as to the pathological conditions involved. For example, some tooth pastes or mouth washes are supposed to be very highly astringent and antiseptic.

There are certain conditions in the oral cavity where an antiseptic mouth wash is desirable, but not desirable in all cases. We even find that the dental profession as a whole does not take the recognition of the fact that a mouth wash which may be desirable in pathologic conditions is not necessarily desirable in the case of an individual who has a healthy mouth. In other words, they make no distinction in regard to the different pathologic conditions or even the difference between a healthy mouth or one that is diseased, but prescribe the same tooth paste, the same tooth powder, and the same mouth wash, regardless of the conditions which are present.

The author makes the statement that tooth pastes and tooth powders are more prevalent than there were in times past, that a greater number of people are using them and also that a greater number of people have pyorrhea and pathologic conditions of the mouth than they did in times past. Both of these statements are true, but nevertheless I do not know as it is any reason why one should be considered with the other. I do not believe that the use of tooth paste and powders have any effect upon the number of pathologic conditions which we find in the mouth. I do not believe that the use of tooth paste or the lack of the same will affect the number of pyorrhetic conditions we find in the human family one way or the other.

The reason we find a greater number of pathologic conditions present in the oral cavity at this time is because of the manner in which individuals live and because of the kind of food which they employ. Dr. Skinner's reference to the use of the teeth and the kind of food used is probably the greatest factor in the production of pyorrhea or the lack of pathologic conditions than anything which we have at the present time. If individuals today lived the same as they did in former years we would find the same number of pathologic conditions present as we found in former years. In other words, we would find them to be very few and the large amount of pyorrhetic conditions which we see now would not be seen.

Therefore, the greatest measure of oral prophylaxis is the use of the food and the use of the teeth in such a manner as they were intended. Associated with that is the fact that the teeth in order to be kept clean must be in such a position as they can be cleansed. Therefore, a set of teeth in normal occlusion, with the proper kind of use will be practically free from dental ills. Teeth with a similar kind of usage which occupy positions of mal occlusion will not be free from dental ills. Or, we could change the question around in another way and state that the teeth which are in normal occlusion and do not receive the proper usage will also not be free from dental ills.

Though the two great factors in the prevention of decay and pyorrhea are the teeth shall be in a normal position and they shall have the proper usage, whenever this is produced it will not make any difference whether you use tooth paste containing honey, or whether you use tooth paste containing something else. But when the teeth are in normal occlusion and receive the proper use then we will find that dental lesions will be on the decrease instead of the increase. It is very well for us to call attention of the public to the dental ills, the ravages of decay, and the systemic effect produced by dental infection, and we may be able to accomplish a certain amount of good by that line of teaching. However, the question remains, that the real trouble is back of the fact that people are not using the teeth enough to keep them properly cleansed. The child is not using his deciduous set of teeth sufficiently to produce the growth so that the permanent teeth can occupy normal position and consequently the whole cause for dental ills and the whole change of conditions which are brought about may be summed up to civilization. Nevertheless, this does not relieve the dental profession of their responsibility and we must do what we can to prevent the ravages of decay, to prevent dental infection from the large number of conditions working against us at the present time.

DR. CARMICHAEL—Closing:

I am greatly pleased that my paper has been so generally well received. I haven't taken note of any serious objections to the very decided views that I have expressed this evening. I could not expect you to agree with me altogether. However, I have made one very strong statement, and one which I expected would give rise to a question calling for a more general discussion, and that was, "are we in error in prescribing the ready made tooth powders and pastes that are now in general use?"

This is an age of tooth pastes, and it was the intention of my address to, as forcibly as possible, drive home a few prophylactic principles that should be recognized by the profession, and that is, "that all inflammation is due to invasion of bacteria into the living tissue—that it is impossible to employ an antiseptic in a mouth wash, or in a dentifrice, that will destroy the micro-organisms without killing the living tissue. That the only possible means of terminating bacterial activity in the mouth is to free the teeth and gums from all putrescent, clinging matter which serves as a culture bed for the development of bacteria.

I make the statement that pyorrhea is becoming more prevalent and how can we account for it? People are certainly giving more attention to their teeth than in the days gone by. Dr. Skinner says, "lack of proper exercise in the mastication of coarse foods." This is a good point, and goes far toward maintaining a normal functioning of the tissues, but what about after nature's forces of resistance begin breaking down, and infection has found lodgment about the gum margin? Are we then going to supply a culture bed for bacteria by rubbing in and about those detached gum margins sticky, gelatinous substances, which, aided by the heat of the mouth, ferment and decompose, thereby enhancing bacterial activity? No, gentlemen; it is for the dentist to advise his patient as to the correct procedure in the home treatment of the teeth.

The greatest service a dentist can render is to remove the cause that is producing an unhealthy condition, and the treatment that he may prescribe is equally as important as the operation he may perform.

There would be no occasion for dentists to say that pyorrhea is incurable if the "Follow Up" treatment was properly conducted. We know, if the same conditions are allowed to prevail that cause pyorrhea in the first place, most naturally we would have a recurrence of the disease.

There are patients who do not know how to properly brush their teeth, and when you suspect this, have them BRING the toothbrush to the office and give them a lesson. I have often done this, and it proved to be just what was needed.

Dr. Dewey says, "I do not believe that the use of tooth pastes or the lack of them, will affect the number of pyoretic conditions that we find in the human family, one way or the other.

The speaker strikes a favored chord. I agree that most of the dentifrices may properly claim that they leave a good taste in the mouth—but that's all.

When Dr. Dewey experiments with the products that I have been privileged to present to the profession, I trust that he will add to the only means now known to him, at least one more.

Each and every one of us knows that we should make a thorough investigation and put to a conclusive test, every theory that appeals to us; and to devote ourselves to the spread of the correct doctrine applicable to every situation arising in our profession. But we have no time. We would, therefore, organize members into groups, entrust a duty to one or another, according to their disposition and attainment, then be guided by the findings so made.

I, for one, have perhaps taken an undue amount of time to carry on experimentation—but I have the satisfaction of placing before you results that are tested and will, I know, be helpful to you in your everyday practice.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

THE DEARTH OF DENTISTS.

A few years ago if any one had predicted that there would be a scarcity of professional men of any kind, he would have been laughed to scorn. The assertion was freely made that the professional schools were turning out graduates at such a rate that all the professions were becoming overcrowded, and that the prospect for a young man seeking to enter a profession was that he would encounter a calling already so congested that his future was handicapped at the beginning. However this may have been true of other callings, it has never been so of dentistry. During the days when our colleges were turning out the greatest number of graduates there was always an opening for every capable and conscientious man. But the hue and cry of the day about overcrowding in the professions undoubtedly had its effect on young men and in many instances they sought commercial life for a career instead of taking up dentistry. This together with the widespread awakening as to the importance of the teeth and the value of dental service has increased the demand for dentists faster than it has been supplied till now there is a situation which is proving a real embarrassment. The emergency created by the entry of the United States in the war has added to the responsibilities of dentists the same as all other classes—in fact, in a greater degree. Military authorities are recognizing more than ever the importance of mouth conditions as they affect the efficiency of the soldier and sailor, and they are making greater demands on the recruits in regard to the nature of their dental equipment before permitting them to enlist. Not only this, but they are seeking to provide better dental service for the enlisted men during the war. On the basis of the present proposed enrolled army they will need at the very least 2,000 dentists in this one branch of the service. The question arises, where are they to be obtained? It requires efficient men, men of character, initiative and judgment to fill a place such as this. We are not graduating enough men to take proper care of the civilian population alone, to say nothing of the demands of the government in the present crisis. In recent years there have been more openings than young men to fill them, with the result that now when the extra demand for dentists comes it is a real dilemma to supply it. The government has recognized this to the extent of requesting that the undergraduate students in dental colleges at the present time be urged to remain in school and finish their courses rather than enlist for military or naval service. It is claimed that they will be needed in the capacity of dentists more than in any other branch of service.

The conditions which have led up to the present scarcity of dentists cannot be controlled now because they are matters of the past, but the thing that can be done is to stimulate those who are in the profession to a more exalted consecration to duty, and to a resolve that every man and woman in dentistry shall do his or her utmost to meet the present emergency by redoubled effort and if necessary by self-sacrifice. We must all work as we have never worked before—work with the motive of proving to the world that the function of the dentist is no mean one in the preservation of human health, and that we are all willing to do our full share in providing for the welfare of the defenders of our country and the people in our respective communities. We do not so much need to make more money as we do to "make good."

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. VII.

My Dear Boy:—If I thought the time would ever come when you would prostitute the profession or do anything to drag it down I could curse the day that you ever became a dentist, or became

"My Boy." Somehow that would sink a shaft into me and leave a scar as long as I live. Nothing hurts me to the very core like seeing one of "My Boys" go wrong. And in every case I blame myself. Somewhere or in some way along the line of my association with them I must have failed in my duty else I would have left an impression strong enough to keep them in the straight and narrow way. We older men in the profession have a serious responsibility, and this I realize more and more as I watch the careers of the younger men. It is the most natural thing for them to look to us for advice, for direction, and, most of all, for example. I realize that "talk is cheap," and that no matter how much we may admonish them, unless we set the example of correct professional conduct we shall not go far toward holding them in the line of true ethical principles. Even if I were ever tempted to do an unethical thing on my own account, I could never bring myself to do it in consideration of the effect it might have upon the "Boys."

He who deals with young men entering the profession has a grave responsibility which has to do not only with the technical training he gives them, but, to my mind, more particularly with the influence he exerts over them in the way of correct living. I fear that this is too frequently overlooked by the older men, and I have deplored this fact more than any other in connection with educational activities.

But there is another side to this, my Boy, which I think it will do well for you to consider. Even granting the very potent influence of example, I must call your attention to the fact that in the ultimate analysis of the situation you are, more than any one else, the arbiter of your own fortune. It lies not within the power of man to make you good if you are of your own volition determinedly bad; any more than the most pernicious example on earth can send you astray if you are determined to be good. The responsibility is mutual after all, and now in this confidential manner I am going to pledge you to do my part in as full a measure as I can if you will in like spirit make the effort to do yours.

If you are to find the road to ethical practice easy you must surround yourself with the right kind of associates. It is easier to float with the tide than to go against it, and if you connect yourself with ethical people you will not find it hard to be ethical.

As a practical suggestion let me advise you to identify yourself with dental societies. You will need the association afforded by the societies, and the societies will need you. Seek out the older men in the societies in whom you have confidence, and take counsel with them. They will always be glad to aid you in every way possible when they see you are in earnest. It may require a little time for you to prove to them that you are in earnest, and meanwhile "preserve your soul in patience." Do not be hypersensitive if the older men fail to estimate you at your full value at once and decline to serve you an office on a silver tray. It may be that they have not yet found out what a perfectly wonderful chap you are. Sometimes young men feel that they do not receive sufficient encouragement from the older men. This may in some instances be true, but it is always due to an oversight, and not to any desire to slight the new recruits. The members of dental societies are only too glad to welcome new men and to give them the recognition they deserve.

When you are in the society do your part like a man. If placed on a committee, serve faithfully, and do not be merely a straw man. If solicited to go on the program for an essay, or clinic, accept if you can serve, but otherwise keep your name off. One of the cardinal sins of society members is to permit their names to appear on a program and then fail to attend. It may happen to a man that through unforeseen circumstances he is prevented at the last minute from attending a given meeting, and this is always excusable; but to make a habitual practice of parading his name on the program of a society when he has no intention of serving is the pettiest kind of advertising, and will sooner or later land the one who does it into discredit.

If elected to an office, as you are likely to be in time, serve as faithfully as if it were your own personal affair. That is really what it is. You have an integral interest in the welfare of any society of which you are a member, and without this kind of a spirit permeating an organization it can never fulfill its legitimate function. Play the game always like a good soldier, and do not permit the petty differences which sometimes infest a society to disturb you or affect your equanimity. Dental society members are human, and occasionally they disagree. Do not shrug your shoulders and say that this is no place for you. It is the very place for you. It may need just such a man as you to harmonize the factions and pour oil on the troubled waters, and there is no higher function you can perform for a dental society than this.

If you follow along these lines, I predict that you will find your dental society associations among the most pleasant of your life. There is a comradship which develops among the members which in the growing years becomes very precious—a brotherly affection which lends real significance to the signature "Fraternally yours."

And this reminds me of a small matter to which I wish to call your attention. If you are to consider yourself "My Boy," then I want you to do me the favor of answering your letters promptly. To fail to answer letters seems to be a prevailing sin among dentists. I am jealous of the reputation of the profession, and I am particularly jealous of your reputation, and I dislike to have this reflection cast upon you. It is undignified, unethical and ungentlemanly to habitually ignore letters that are written to you. Preserve your manhood in this respect, and I will forgive you many other things. I have one other small request in this connection, and I make this request on bended knees with all the fervency of my soul. When you sign your letters do not sign your title. Please do not. An expectant world may be feverishly waiting for the information that you are "Dr." John Smith, but let them find it out in some other way than by parading it at the end of your letters. Bless your heart, you are pardonably proud of your D. D. S. degree, and I am equally pleased that you have it. But it lowers your pride and takes all my pleasure when you sign your letters: "John Smith, D. D. S.," or "Dr. John Smith." Please bear in mind that "John Smith" is ample, and I will not blush so much for you.

Sincerely your friend, C. N. J.

BOOK REVIEWS.

Modern Dental Materia Medica, Pharmacology and Therapeutics. Including the practical application of drugs and remedies in the treatment of disease. By *J. P. Buckley, Ph. G., D. D. S.,* Professor and Head of the Department of Materia Medica, Pharmacology and Therapeutics, and formerly Director of the Chemical Laboratories, Chicago College of Dental Surgery. Fourth edition, revised. One hundred forty-six illustrations. 494 pages. Price $3.50 net. Published by P. Blakiston's Son & Co., Philadelphia.

The fourth edition of this splendid work has undergone a complete revision. This was done to bring it in harmony with the United States Pharmacopeia IX., which became official September 1, 1916; and in accordance with the most modern methods of treating dental diseases. The author is one of the progressive men in the profession, and can always be depended on to advance the latest ideas in theory and practice. This is particularly true in his treatment of the subject of pulpless teeth in the present volume, which is brought down to date and is amply illustrated in such a way as to present each procedure vividly before the reader. The many colored plates used in this volume are a distinct addition to the value of the work, and the profession is once more placed under deep obligation to the author for his painstaking and detailed presentation of a subject with which his name has been so long and favorably associated.

DENTAL PHYSIOLOGY AND ORAL HYGIENE. By David Stanley Hill, D. D. S., Effingham, Illinois. 167 pages. Published by the Le Crone Press, Effingham, Ill.

This is a book intended for the most part to be distributed among the laity. It is clearly written and much to the point, containing valuable advice on the care of the teeth and their surrounding structures. It is well that as much wholesome literature on this subject as possible be distributed among the people to the end that the parents will become informed on the necessity of early care of their children's teeth, and thus prevent much of the misery caused by neglect. Dr. Hill's book will aid in this important service and thus it is entitled to a hearty welcome on the part of the profession.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Prevent Scratching Cement Slab:—After boiling, scrape cement off with the edge of a block of hard wood.—*H. Reid Staley, Harvey, Ill.*

Slow Pressure for Setting Dowel Crowns:—You may not know at the time that you have fractured a root or tooth in setting a dowel crown or inlay by driving it to place with a mallet, but you will find it out later. Freshly mixed cement is a liquid with the physical property of transmitting force equally in all directions. Any blow or sudden application of force is received by the frailest part of the supporting structure. Steady pressure applied by a plugger or file that cannot slip accomplishes the object more quickly and accurately with less risk and discomfort to the patient.—*J. Frank Nelson, Chicago, Ill.*

Gold Coated Tungsten Wire:—For dowel pins this seems, after employment of several feet of it for such purpose, a most desirable substitute for platino-iridium or platinum gold alloys. Recently $5 secured the writer one foot length of 22 gauge, six-inch length, each of 15 and 16 gauge which illustrates saving over same gauges of platino-iridium. Forward check to Research Institute N. D. Assn., 8803 Euclid Ave., Cleveland, Ohio, and specify sizes you desire. Instead of using cutting pliers the tungsten wire must be cut with carborundum knife edge wheel and this is practically the only variation in its use one need become accustomed to. While very hard, tungsten possesses to some extent property of bending without fracturing but to no such extent as materials heretofore used.—*J. F. F. Waltz, Decatur, Ill.*

An Easy and Simple Method of Repairing a Crown or Bridge with a Broken Pin Facing:—Take measure from center to center of pins left in the backing, and from the pins to incisal edge of backing and select a new facing with pins to match the measurements and of about the size of the broken facing in other details. Place the convex part of this facing in a small mount of plaster and when well set cut the pins off flush with the porcelain. Add a little oil and with a small drill in the headpiece cut out the balance of pins left in the porcelain. An inverted cone bur and some carborundum powder from the lathe will quickly clean out all metal and enlarge the holes slightly. Reduce the heads of the old pins left in the backing, and grind the facing carefully to adjust it to form of first facing, trying it in the space to be repaired frequently. When shaped roughen porcelain and cement to place. —*Chas. S. Hart, Evanston, Ill.*

To Prevent Splitting of the Upper First Bicuspid:—After filling the two roots (occasionally three roots) you will sometimes find your patient will object to cutting the balance of the crown away to make a sightly crown. So you are persuaded to fill this tooth, either by his or her pleadings or by your own desire to please, or as it was with me, not realizing how many split. Most of these bicuspids are frail. Just look at the anatomy of the thing and see that small root in circumferance, and then note the distance around the tooth proper; and look at the deep cusps. To prevent this bucco-lingual splitting I insert an irridio-platinum staple in the roots, so bent that the prongs will fit nicely into each root. If I use a compound gold inlay I can cast the staple in my inlay, but if I use Berylite I first cement the staple into the roots, leaving quite a bit exposed in the cavity of the tooth, which acts as an anchor for the Berylite as well as an anti-splitter. In most M. O. D. cavities this is "good dentistry."—*Homer Almon.*

A Gold Crown for a Short Root:—When, for any reason, a gold crown is desired for a short root the following suggestions will be found to be very practical. Bevel the end of the root slightly with a very fine fissure bur made tapering to fine point to avoid lacerating the gum, then screw or cement a post, made of clasp metal wire, in the canal of the root with the post protruding out of the root nearly the length of the crown to be used, then take an accurate measure of the end of the root (different methods for taking an accurate measure could be suggested) so that the edge of the crown, when set, will fit closely around the root under the free margin of the gum, then shape the end of a fissure of hard wood the exact size of the end of the root, then take a strip of thin, flexible steel plate, such as is used for matrices, and wind it around the wood and secure it with waxed silk floss, then withdraw the wood from the temporary steel plate band, and place the steel band on the root, then fill inside the steel band upon the root and around the post with amalgam. When the amalgam has hardened cut the floss that held the steel band together and unwind the steel strip, which will leave an amalgam tooth firmly secured to the root, then make and set the gold crown over the amalgam tooth —*H. A. Cross, Chicago.*

MEMORANDA.

STATE BOARD OF DENTAL EXAMINERS.

The North Dakota State Board of Dental Examiners will meet at Fargo July 10. All applications and credentials must be in the hands of the Secretary July 1. For further information and application blanks, write W. E. Hocking, Secretary, Devil's Lake, N. D.

ILLINOIS STATE DENTAL SOCIETY.

The fifty-third annual meeting of the Illinois State Dental Society was held at Quincy from May 8 to 11. An invitation was extended to the National Dental Association to meet in Illinois in 1918. The next annual meeting of the State society was not determined but will be announced later. The following officers were elected: J. E. Hinkins, Chicago, President; W. L. King, Quincy, Vice President; J. P. Luthringer, Peoria, Secretary; L. B. Torrence, Chester, Treasurer; G. H. Henderson, Chicago, Librarian.—J. S. Luthringer, Secretary.

SPECIAL NOTICE FROM WAR DEPARTMENT.—OFFICE OF SURGEON GENERAL.

EXAMINATION OF DENTISTS FOR THE U. S. ARMY.

The Surgeon General of the Army announces that examinations for the appointment in the Dental Corps of the Army will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado, and Fort McDowell, California, on Monday, May 7, and Monday, July 2, 1917.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 32 years of age, a graduate of a dental school legally authorized to confer the degree of "D. D. S." and shall be of good moral character and habits.

Successful applicants will be immediately appointed (as far as the number of vacancies will permit) to the grade of First Lieutenant, at an entrance salary of $2,000 per annum.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present 14 vacancies to be filled and on July 1, 1917, there will be 22 additional vacancies.

The following letter from Dr. Hayes explains itself. It will prove of interest to our readers:

AMBULANCE HOSPITAL OF PARIS, HOSPITAL BENEVOLE, NO. 2 BIS.
Neuilly-sur-Seine, Le May 14, 1917.
Mrs. Archibald Freer, 1420 Lake Shore Drive, Chicago, Ill.

My Dear Mrs. Freer.—Your letter of April 24th has just been received together with cheques for frs. 4347.80 and frs. 890.62. The wonderful success of your booth at the Allied Bazaar has awakened great enthusiasm among all the members of the Dental Department, and I wish to assure you of our most grateful appreciation of this second contribution, which was totally unexpected after your first splendid cheque.

Having been among the first to realize the need and importance of a department of dental and facial surgery and to successfully treat these cases of mutilation of the face and serious fractures of the jaws, it is most gratifying to see the development which this branch of war surgery has attained. There are now twenty-nine centers in France for the treatment of these wounds, and our hospital alone has received seventy-five new cases since the last offensive.

Owing to the increase of work and prolongation of the war, it has seemed necessary and advisable to re-equip and reorganize our department, with the result that we are now working under the best possible conditions, both for the patients and operators. It is our endeavor to make this department truly representative in every way of American progress in dental surgery and a model of what is most useful and advantageous in the treatment of these wounds.

Please extend to your co-workers our most hearty and sincere thanks for their efforts in our behalf, and our congratulations on the wonderful results of their work. Believe me,

Very truly yours,
(Signed) GEORGE B. HAYES,
Chief Dental Surgeon.

May a second appeal be made to the dentists of Illinois who have not contributed to the above fund, to assist me in keeping this department in supplies by the contribution of $3.00 a year (25 cents a month) during our war?

Contributions may be sent to MRS. ARCHIBALD FREER, 1420 Lake Shore Drive, Chicago, Chairman.

INFORMATION RELATING TO APPOINTMENTS IN THE DENTAL RESERVE CORPS OF THE ARMY.

The National Defense Act of June 3, 1916, and the tentative regulations thereunder, provide for a dental section or branch of the Officers' Reserve Corps. The officers of the Dental Reserve Corps have the rank of first lieutenant, and are appointed and commissioned by the President after having been found, upon examination prescribed by him, physically, mentally and morally qualified to hold such commissions. Commissions are issued for periods of five years, at the end of which time the officers may be recommissioned, subject to such further examinations and qualifications as the President may prescribe. They are subject to call for duty in time of actual or threatened hostilities only. While on active duty under such call, they are entitled to the pay and allowances (including quarters, fuel and light) of their grade. They are entitled also to pension for disability incurred in the line of duty and while in active service. They are not entitled to pay or allowances except when in active service, nor to retirement or retired pay.

Appointees must be citizens of the United States, between 22 and 55 years of age, must be graduates of standard dental colleges, and must, at the time of appointment, be in the active practice of their profession in the states in which they reside.

The examination is physical and professional. It is conducted by boards consisting in each case of one medical and two dental officers of the Army, designated by the War Department.

The examination as to physical qualifications conforms to the standard required of recruits for the United States Army. Defects of vision resulting from errors of refraction which are not excessive, and which may be entirely corrected by glasses, do not disqualify unless they are due to or are accompanied by organic disease. Minor physical deficiencies may be waived.

The professional examination will be oral; if the applicant fails therein he may, if he desires, have a written examination. An average of 75 per cent is required to qualify in the examination. The examination comprises the following subjects:

1. Dental pathology and bacteriology.
2. Chemistry, physics and metallurgy.
3. Recent advances in dental surgery and technique.

Applications for appointment in the Dental Reserve Corps must be made in writing, upon the prescribed blank form, to the Surgeon General of the Army, Washington, D. C., who will supply the blank upon request. The correctness of the statements made in the application must be sworn to by the applicant before a notary public or other official authorized by law to administer oaths. It must be accompanied by testimonials based on personal acquaintance, from at least two reputable persons, as to the applicant's citizenship, character and habits, and by his personal history given in full upon the blank form furnished him for the purpose.

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS.

PARTIAL PROGRAM.

Up to date the following reports have been received from the various Section Chairmen, Committeemen, etc:

Section I. Chairman, Dr. E. D. Coolidge, 59 East Madison street, Chicago, Ill. "Some Neglected Operative Pre-requisites," by Dr. Fred E. Hart of San Francisco. "Porcelain Inlays" (except title not yet chosen), by Dr. W. L. Fickes, Pittsburgh, Pa. "Interpretation of Radiographs," by Dr. Howard R. Raper of Indianapolis, Ind. "Present Tendencies in Operative Dentistry," by Dr. J. M. Walls of St. Paul, Minn. Also an important paper dealing with the subject of dental education. Essayist not selected as yet.

Section II. Chairman, Dr. F. B. Moorhead, Peoples Gas Building, Chicago, Ill. Dr. Virgil Loeb of this committee reports that he has thus far accepted two essayists: Dr. Elmer S. Best of Minneapolis, on some phase of root canal filling, and Dr. Howard R. Raper of Indianapolis, on "Misinterpretation of Radiographs."

Section III. Chairman, Dr. L. E. Custer, 28 North Ludlow street, Dayton, Ohio. "Ionization, with Special Reference to Ionic Chemistry," by Dr. Geo. T. Fette, Cincinnati, Ohio. "The Chemical Action of Soil Bacteria on Calcium Phosphates, with the Chemical Analysis of the Human Teeth," by Dr. J. E. Hinkins of Chicago, Ill. "Why Measurements of the Mandible, Tracings of the Condyles, the Construction of Hypothetical Triangles and the Use of the Face-Bow Are All Non-Essential in the Construction of Dentures Possessing the Highest Degree of Efficiency," by Dr. D. D. Campbell of Kansas City, Mo. "Paper, subject to be announced later," by Dr. Calvin S. Case of Chicago, Ill. Also two other papers, titles of which will be reported later.

State Society Officers' Section. Chairman, Dr. John C. Forsyth, 430 East State street, Trenton, N. J. First Session: "Some Phases of Post-Graduate Work," by Dr. B. L. Shobe, Tulsa, Okla; "Securing Some Satisfactory Legislation," by Dr. Alexander H. Reynolds, Philadelphia, Pa. The Second Session will be devoted to six or seven short papers of five to ten minutes each by men of different State Societies, telling of some outstanding feature of their State Society's work that is thought to be of the greatest importance; or, if the essayist prefers, he may present the weak part of the work and ask for suggestions to help them out. These papers are to be followed by a general discussion which we hope will bring out some very valuable points. The names of the essayists for this session have not as yet been secured.

Committee on Anesthetics. The Secretary of this Committee, Dr. Chalmers J. Lyon, of Ann Arbor, Mich., reports as follows: "The Teaching of Conductive Anesthesia," by Dr. Theodore Blum of New York city. "After-Pain in Local and General Anesthesia," by Dr. A. E. Hertzler of Kansas City, Mo. "The Toxicity of Local Anesthetics," by Dr. Geo. B. Roth of Washington, D. C.

Committee on Entertainment. At a recent meeting of this Committee a Ladies' Auxiliary was organized, of which Mrs. Dr. M. L. Rhein was made the chief officer, and Mrs. Dr. Henry W. Gillett, 140 West Fifty-seventh street, New York city, secretary. It would greatly facilitate the endeavors of the Ladies' Auxiliary to add as much as possible to the pleasures and comforts of the visiting ladies if those who intend to come to New York would notify Mrs. Gillett, stating, if possible, the hotel at which they will be registered.—R. Ottolengui, Chairman Publicity Committee.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

HEADQUARTERS, 131 ALLEN ST., BUFFALO, N. Y.

The Preparation of the Mouth of Applicants for Enlistment.—This is without doubt the most important service the Preparedness League of American Dentists can, at this time, render our government. We request all members when possible to fulfill this duty in a most conscientious manner. We are proud of the work our profession thus far has done in a most generous and unselfish spirit.

The applicant should not receive our gratuitous service until he has been rejected by the army examining officer because of defective teeth alone.

Suggestions.—1. See that the applicant is worthy and unable to pay for dental service.

2. He should be accompanied by a non-commissioned officer from the recruiting station to the dentist, bearing a letter written on war department stationery, signed by the examining officer in charge of the recruiting station. When completed especial care should be observed to return him to the recruiting station to complete his enlistment.

3. When unaccompanied, the League suggests that the applicant sign his name on the letter furnished by the examining officer, which signature should be duplicated upon his arrival at the dentist. This will obviate the possibility of transferring the privilege to another person.

Our service has to do with the applicant before enlistment and not with the recruit who has taken the federal oath. Such cases are for the government to take care of, because it can not accept gratuitious service. We thereby will create a greater need of an adequate corps of Army Dental Surgeons.

Procedure.—1. The committee in charge should always be members of the League. A canvass, either personal or by mail, should be made among the dentists within the territory of the recruiting station to determine the time and number of hours which each dentist will give for this purpose. All applicants may then be referred in regular order to the League members for service.

A feasible and successful plan may be followed by arranging with the recruiting officers for a dentist to visit said station for a half hour on one, two or three days each week as conditions may require, when all dental defectives may be examined, charted and assigned to volunteer surgeons for treatment.

2. In some instances a room in close proximity to the recruiting station has been equipped for service, thereby obviating several features mentioned in above suggestions.

Public dental clinics, such as Dental Colleges, free city dispensaries, as well as private offices are, in many localities, being utilized for this purpose.

These problems must be met as indicated by the varied needs and conditions presenting themselves in different sections.

Dental Requirements.—*A clean mouth never produces disease.* The most essential requirement is to make the mouth hygienic.

Dental Requirements for Applicants for Enlistment to the Army.—Four molars or bicuspids on one side and so opposed as to serve the purpose of mastication, will admit an applicant to the army or militia, provided there is absence of all disease producing conditions, such as broken down or abscessed teeth and roots, acute pyorrhea or infectious conditions of the mucous membrane of the mouth, etc.

Bridge work and properly filled teeth count as sound teeth. Partial dentures may be accepted, provided the above requiremnts are present, but full dentures are not permitted.

Dental Requirements for Enlistment to Navy.—Twenty sound teeth.

Four opposing incisors.

Four opposing molars.

Bridge work and properly filled teeth count as sound teeth.

True pyorrhea is cause for rejection.

Full and partial dentures are rejected by the navy.

In regard to this work we recommend—1. That only enough dental service be rendered to enable applicant to enlist.

2. That fillings be limited to cements and amalgam.

3. That no plate work be undertaken, as the enlisted man can so easily break or throw it away, thus claiming disability.

DR. WILLIAM F. LARKIN.

When a dentist does anything of distinction outside of his profession it is fitting that the fellow-members of his craft should rejoice with him and take pride in his achievement. Dr. Willam F. Larkin, in addition to being a dentist, is a singer. He long ago sang himself into the hearts of his friends in Chicago, not only in the profession, but in church work and at public dinners, particularly those given by the "Forty Club." He has a wonderfully rich and well modulated voice which carries his hearers with him from the first note, and makes him a general favorite wherever he sings. Recently a distinguished honor has come to him. The Victor Record people having heard of the quality of his voice approached him to make a record for them. He sang his favorite, "Take Me Back to Babyland," which so captivated them that they immediately engaged him to make records for them. Two of his songs are announced by the Victor people for July delivery, "Take Me Back to Babyland" and "If I Were King of Ireland." Thus the Larkin voice will go out into homes everywhere, and dentists who have not had the pleasure of hearing Dr. Larkin sing in person will now be able to avail themselves of the privilege of listening to his voice through the agency of the Victor machine.

DR. WILLIAM F. LARKIN

The editor of this journal is going to grab those records the moment they are on the market, and then he is going to sit down quietly in the twilight, close his eyes, and revel in the tones which he has heard so many times in public. And next to the pleasure of hearing Larkin sing himself, this will be the best thing ever. Hats off to "Bill" Larkin. That is what we call him affectionately in our Chicago circles—and he stands for it.

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THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, AUGUST, 1917 No. 8

WHAT SHALL BE DONE WITH PULPLESS TEETH?*

BY THOMAS L. GILMER, D. D. S., M. D., CHICAGO.

The title of this paper was not formulated by the writer. He is not so presumptuous as to believe that he con give, at this time, answer to the question propounded by the Chairman of the Program Committee that will satisfy either those holding the radical opinion, that all pulpless teeth are a menace to health, or those who make light of the danger of pulpless teeth, even though they are abscessed.

Dentists and physicians having these divergent opinions offer arguments which satisfy themselves, but not all others. Those believing that all pulpless teeth should be removed can, in defense of their theory, point to case after case of secondary disease which has been cured when pulpless teeth have been removed. But they do not diffentiate closely between abscessed pulpless teeth and pulpless teeth which are not all abscessed. All pulpless teeth are not a menace to health, since they are not diseased. On the other hand, those who do not believe that secondary manifestations resulting from infected pulpless teeth are a common cause of secondary disease defend their belief by asserting that if this were true, secondary manifestation would be much more common, because almost all adults have one or more infected pulpless teeth. Men holding this belief forget that the same bacteria vary in virulence at different times; also that the resistance of the body varies at different times. When one's vigor is fully up to par the bacteria are unable to develop, or are rendered inert by the natural resistance of the body. It is a matter of relative susceptibility and immunity. All dentists have observed, at times, a change from chronicity in an abscess to one of acuteness, after the patient has been exposed to debilitating influences, such as exposure to cold, fatigue, etc. The physical condition of the patient has been changed by the lowered vitality from immunity into one of susceptibility, the bacteria having overcome the resistance of the tissue elements with an acute alveolar abscess as the result. With a similar lowered vitality the escaping organisms from chronic processes are not overcome, and when they reach an organ or part which is debilitated by injury or otherwise, secondary infection results. Those who have studied the subject with painstaking care are satisfied that abscessed teeth may be the source of secondary manifestations of disease. The proof lies in the disappearance of the secondary lesion with no other treatment that the elimination of an apical infection. That there is failure of cure in some instances following the removal of the primary focus does not offset the great preponderance of evidence which demonstrates numerous cures after extraction and drainage of abscess cavities. This anyone may discover if he makes intelligent investigation of the subject. Failure to cure by removal of abscessed teeth may also mean that other sites of infection are present. Diphtheria is not in every instance cured by the use of antitoxin, still no one versed in medical knowledge would say that diphtheria antitoxin treatment is a failure. It is too much to expect that function will, in all instances, be restored, even if the initial cause is removed. If a joint has been so long diseased that the articulating cartileges have been destroyed, or permanently injured, it would be unreasonable to expect that perfect function will be restored by eliminating the primary cause. Neither is it reasonable to suppose that an iritis or neuritis will, in all cases, subside at once, even if the primary cause has been removed. In many instances time is necessary before a part can be restored to its normal condition and eliminate all of the toxic elements which have been accumulating for years.

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*Read before the Illinois State Dental Society, May, 1917.

It is doubtless true that some valuable teeth are being sacrificed which should be retained. No one values the dental organs more highly than the writer. The best artificial dentures are at best but poor substitutes for the natural organs. However, if one's health is impaired by diseased teeth and it is impossible to cure the infected area about the roots of such teeth, then they should be removed, as life and health are far more valuable than one or several teeth.

We must look at the subject of pulpless teeth from the rational viewpoint and ask ourselves what shall be done with such teeth in the particular case in hand. To say that all pulpless teeth must be sacrificed, regardless of conditions, is unreasonable. To say that all infected pulpless teeth should be retained regardless of conditions is equally illogical. Somewhere between lies the truth, and the truth is what we all desire.

The question—what shall be done with pulpless teeth?—is more prominently before the dental profession at this time than any other question. How shall it be answered? It cannot be fully answered now, the data are insufficient. I am of the opinion that if a pulpless tooth has one or more of its roots partially denuded of peridental membrane, that part of it uncovered is dead, therefore a foreign body. We are told by some that if the root canals of such teeth and the abscessed area be made aseptic, and the root canals filled to their apices, no further danger need be anticipated. Unless the cementum is covered so that it is completely protected from bacteria, the dead portion will be a constant menace. Doubtless, in some instances, apical abscesses with denuded cementum may be rendered sterile by treatment, but who has proven that such an area will remain sterile indefinitely? Temporary immunity is not sufficient. Dead uncovered cementum is just such an area that offers the best possible field for the collection and growth of bacteria. If we can be assured that the blood streams will never contain pyogenic organisms, and the bacteria cannot reach the dead cementum from any other source, then danger from subsequent infection of such roots is excluded; but this cannot be anticipated until we know some way of barring bacterial invasion from the body.

In trying to answer the pressing question before us, several things must be considered. First, and the most important question, is: What is the immediate physical condition of the patient? Second: What is the extent of the infected area? Third: Are the teeth involved in apical infection susceptible to surgical or other treatment, and if so, what are the probabilities of nature's aid in keeping them cured? Fourth: Is the tooth involved of great or little value cosmetically or for mastication?

The first question, What is the immediate physical condition of the patient? is all-important. If one's life is at stake, and infected teeth are suspected as a cause of his disease, then remove all diseased teeth, even if the infected areas be but slight. Even if there is no immediate danger to life, if one has disabling metastases, which may reasonably be supposed to be due to infected teeth which cause him pain, or which already have caused permanent injury to his joints, eyes, heart or other part, then remove the diseased teeth preferably to attempting cure of such teeth by any means known at this time.

The second question, What is the extent of the infected area? If the patient's physical condition is good and we can be sure that the area involved does not include dead cementum, and if there is little destruction of bone, if the nature of the canals is such that they may be thoroughly disinfected and filled to their apices, then such teeth may be retained, but they should be kept under surveillance to discover any changes that subsequently may take place. If a pulp of a tooth dies, or is killed, and the root has been rendered aseptic and properly filled, and there is no evidence of apical infection, such a tooth may be retained, but it likewise must be kept under careful observation. If a root canal has been so filled in by dentine as to prevent opening it up to its apex, except by extensive drilling, then such a root, if not abscessed, may be allowed to remain in the jaw. We have not infrequently seen such roots free from apical infection when another root of the same tooth which has been perfectly filled has become abscessed.

Third, Are the teeth involved in apical infection susceptible to surgical or other treatment, and if so, what are the probabilities of nature's aid in keeping them cured? If the peridental membrane has not been destroyed, then disinfection of the root canals and the apical area may bring about a cure, when, if the root canals are perfectly filled, there is a reasonable promise of a permanent cure. If too much of the cementum is not uncovered, and there are no complications or serious physical disabilities, resection of the roots of certain teeth may be made with a reasonable prospect of cure; however, as yet we have insufficient data to warrant the statement that the cure will, in all cases, be permanent. Though all the dead cementum be removed by such an operation, there is yet the exposed dead dentine and we cannot be sure that it will, in all cases, be covered by an outgrowth of the cementum or otherwise protected. Teeth, the roots of which have been resected, must be frequently radiographed to discover their condition.

Fourth, Is the tooth of little value, either cosmetically or for mastication? If an abscessed tooth has little value in the human economy, although its treatment promises hope of a cure, it should be removed.

After all has been said that can be said at this time concerning the disposition of pulpless teeth, a word should be added about teeth with live pulps. Dentists in the past, in their efforts to replace lost teeth by other means than by plates (I refer to bridging), endangered the pulps of teeth or destroyed them outright, not having been aware of the probable dangers to which they had exposed their patients by this practice. Often the pulps in two teeth are destroyed or endangered that one tooth may be replaced. One should think several times before such operations are undertaken. Dentists have been slow to understand that the roots of two teeth cannot indefinitely bear the additional stress necessitated by mastication and remain healthy, if the work of three or four other teeth is put upon them. Some means other than fixed bridges should be found to replace lost teeth. If the genius which has developed such wonderful skill and art in bridge building turns its talents in the direction of devising partial artificial dentures which will not be harmful to the remaining teeth, a better means of substitution will be forthcoming.

Since our patients are becoming more intelligent in dental matters, dentists have better opportunity, from frequent observation through co-operation of patients, to prevent ravages of dental decay and by this means one is able to conserve the pulps of teeth. It is no vain hope that in time pulpless teeth will be much less common than at present.

It is evident that many errors are made, both by the dentist and physician, in the interpretation of radiographs. An incident: A physician whose mother was suffering from arthritis brought films to me made from her edentulous mandible, and from his readings of the film he was of the opinion that there was indication of a sequestrum of dead bone. I told him that no definite conclusion could be reached unless I could compare the pictures with the jaw. The radiograph did seemingly indicate a sequestrum. On observing the patient as she came into my office at a later date, it was not difficult to see by her walk and the enlarged joints of her hands that she had an arthritis. On examining the mandible at the point that the radiograph indicated a sequestrum, I found it free from all signs of infection. There were no sinuses, no swelling, no induration of the soft tissues, and no cervical gland involvement. Some one, or all, of these symptoms must have been apparent, had dead bone been present. The personal history elicited revealed the fact that in early life the patient had had an accident which caused a fracture of the mandible in this locality. To this I attributed the unusual appearance of the bone.

The angle of incidence at which the ray strikes a film in its relation to the tooth's root has much to do with determining the real condition of the area radiographed. In one film there may be no indication of a rarified area, while another exposure of the same area at a different angle shows positive evidence of an abscess. Resection of the roots of teeth often demonstrates a much larger abscess cavity than the radiograph indicates. This is due either to faulty exposure or to heavy overlying bone. These facts are mentioned to show the importance of the great care necessary in making exposures and the reading of radiographs, if correct conclusions are to be obtained. Many instances might be cited to show that one radiograph may give no indication of an abscess, when another taken at a different angle will show an abscess. Less dense or thin parts of bone, the inferior dental canal, the mental foramen, also the maxillary sinus, at times may deceive those not expert in reading films. Fake pictures resulting from defects in films have, in some instances, led to wrong conclusions. No one should make a positive diagnosis from radiographs alone; he should compare the pictures with the patient's jaws.

Since we are aware that infections about the roots of teeth are a common cause of secondary manifestations in other parts of the body, which in some instances are very serious, we should make use of every effort to prevent exposure of pulps. If the pulps die, or are destroyed, then we should use our best efforts to so treat the root canals of such teeth that infection may not result; or if infection has already taken place, to render the canals sterile and then fill them as completely as possible. Apical injuries due to irritating medicaments used either for the destruction of pulps, or for the disinfection of root canals, or from poisons formed by saprophitic organisms as a result of their action on dead pulps, are often a predisposing cause of alveolar abscess. If the enveloping tissues of the cementum are temporarily or permanently injured, opportunity is offered for infection from the blood stream, and I am of the opinion that it is from this source that pyogenic bacteria are most commonly derived which cause alveolar abscess, rather than from the mouth through the root canal.

I cannot conceive of any service requiring greater skill or more painstaking care, or greater honesty, than the proper treatment and filling of root canals of teeth.

LIMITATIONS OF THE X-RAY IN DENTISTRY.*

BY F. S. O'HARA, M. D., SPRINGFIELD, ILL.

This is the first time in twenty years that the writer has been guilty of inflicting a written discourse upon an audience. It is interesting to know what makes me "break over" at this time. It was formerly my pleasure to drift gracefully into a room full of scientists, have the lantern man turn on the spot light, cast a few slides upon the screen, explain them, make a few jokes in the dark, and bow my way out.

I am prone to confess that I expected to work the old regime at this time, but I was checkmated early.

First, I was asked to perform.

Second, I accepted the challenge.

Third, I was asked the title of my discourse.

Fourth, I gave it.

Fifth, I was then requested to prepare three synopses of my soul sobs, that they might be handed to three spellbinders of the dental profession, who would, each in his turn, after a two-months' diet of raw meat, cuss or discuss my efforts.

All these preliminaries being arranged, I had curiosity to know the mysteries of the "third degree," and you know what curiosity did to a cat.

In browsing around from idea to idea, with nothing to guide my thoughts but the sequence of slides, I had drifted into a bad habit of extemporaneous speaking. After preparing the required epitome of these remarks, I began to think that it were well to mend my fences before the hegira of live stock. Thus I apologize for appearing before you with an actual paper in my hands, and I beg your pardon for following the written lines laid down here.

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*Read before the Illinois State Dental Society, May, 1917.

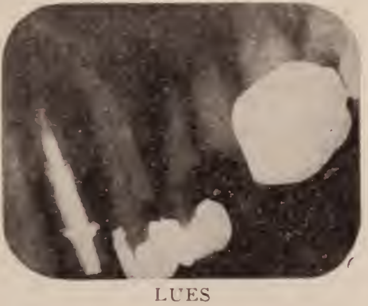
Gentlemen, from the standpoint of a scientific dreamer I am not so sure that the X-ray has been a good thing for future generations. It has opened so vast a field of uncertainties that we automatically divide ourselves into two classes: one the ultra-conservative who save the teeth at all cost; and the second class who revert to the practices of thirty years ago, when the best dentist was he who could fill the air with the most teeth in the shortest space of time. One says: "If it is abscessed, get it out at once." And the other says: "Save it by all means." And we do not know exactly where to get off. The alighting place depending upon whether we sit into the chair of a conservationist or a destructionist. And, gentlemen, most of this chaos was evolved from the findings of the Roentgen ray.

In the solution of the above problem I am not interested save in my own case. I desire to keep my teeth. I think they improve my appearance, and I certainly enjoy the work they do for me at meal times.

I am sure that the limit of value of the X-ray in dental work is much further removed than we think. The limit as seen today lies in our comparative unfamiliarity with this newest aid to scientific dentistry and medicine. We must perfect ourselves in the interpretation of light, shadow and half-tone that is developed upon a dental film or plate. I have frequently experimented with lay persons, and even medical men who were unfamiliar with dental skiagrams, obtaining their ideas concerning films with absolutely pathognomonic findings. I am convinced that it is a matter of higher education or training in the interpretation of films, rather than a limit to the value of the findings themselves. A few years of work along this line makes the student of the primer class a high school scholar at interpreting plates and films.

I can pick up the films of 1910 and see many things upon them that were invisible to me at the time I first emamined them. I can note an improvement in the manufacture of the films. Those I used a year ago did not have the detail of those of a few days since. The makers of Roentgen-ray accessories have done their part to advance our technic. Films are improving, so is our technic, and our ability to read. However, we have not much to expect in the improvement of machines. My biggest transformer will give me a chest in 1-120th of a second, so I can scarcely see how it were possible to wish for faster work; and, in the knowledge that speed and detail cannot coexist, I cannot see where more speed would be advantageous. With the introduction of the Coolidge tube we have something that is sufficiently flexible to meet almost any reasonable demand that may be made, hence, the mechanical side of X-ray work is just about perfect.

Our advance from now on will be in the ability to interpret what we see. There is a possibility of being able to see too much. In leaving this subject, I once more state that there are things upon these little rectangles that we do not yet understand; I insist that the next decade will see most of us better educated in the reading, so we may be able to trace each and every abnormality into its lair.



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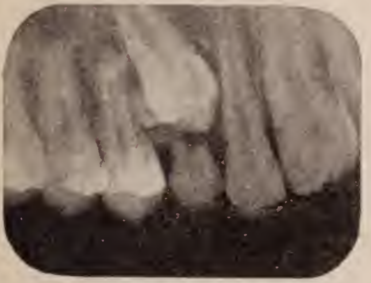
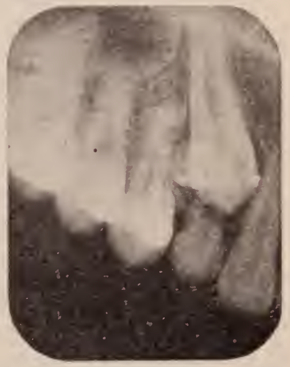


MULTIPLE TOOTH-BUDS

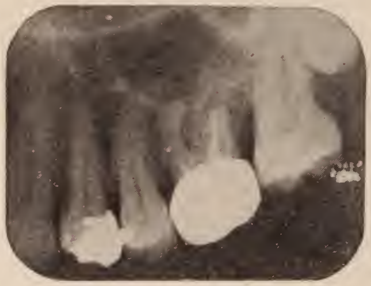


MULTIPLE TOOTH-BUDS

Position of the patient in relation to the tube has a great deal of room for improvement. It is useless for me to remind you of the shape of our jaws. Probably they were built like horseshoes just for luck; but when a well-meaning X-ray man essays to make plates of all the teeth without moving tube, patient, stand and office furniture, he is likely to end up with considerable distortion. There is no standard of technic offered. There should be. And under this heading, in cases that offer the slightest bit of doubt, more than one film should be made, each at a different angle.

Thus it will be possible to look upon more than one side of the matter before forming a conclusion.

Live and dead pulps may be readily distinguished by the X-ray. I shall not endeavor to point out this on the screen, for the magnified slide is not suited to this purpose. The difference in color of the pulps is slight, yet pronounced, and distinguishable to the trained eye, but once in a while we make a *"faux pas,"* which is French for "bum guess." But the man who makes no mistakes does not accomplish much. We learn twice as much from our errors as from our successes. I might include under this heading the ease of detecting pulp stones. Again this is accepted as a matter of course.

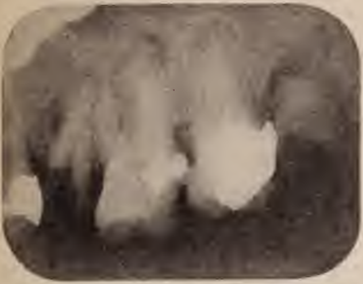


PULP STONE

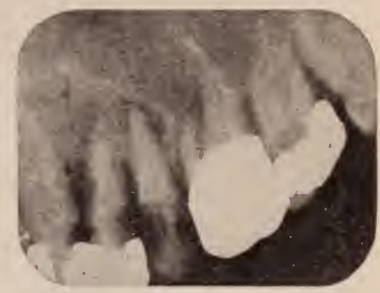
I suspect that the limit of the X-ray would be here apparent, in the division of pulps into dead, dying and living, and I have never so flattered myself that I wanted to undertake this classification.

So let us mark this with a milestone and engrave upon the rock: "We have here the wish that the Roentgen ray could talk and explain conditions as it saw them on its way through."

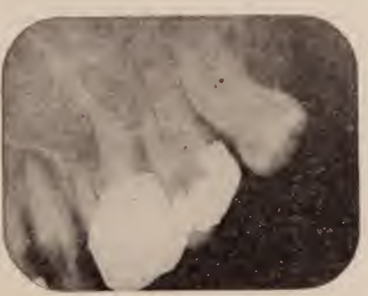
Another milestone, "yard limit No. 2," lies in checking up upon the treatment of apical abscesses with the negative ray. This is perhaps the most frequent source of disappointment to the dentist. All due to the little overlooked bet, that bone takes a long time to regenerate.



APICAL ABSCESS



APICAL ABSCESS



APICAL ABSCESSES

A film is made, treatment is instituted, and in a couple of months a second film shows almost the identical condition. The dentist is discouraged. He forgets that when bone fills in, it does so slowly, and that the young bone is yet transparent to the X-light.

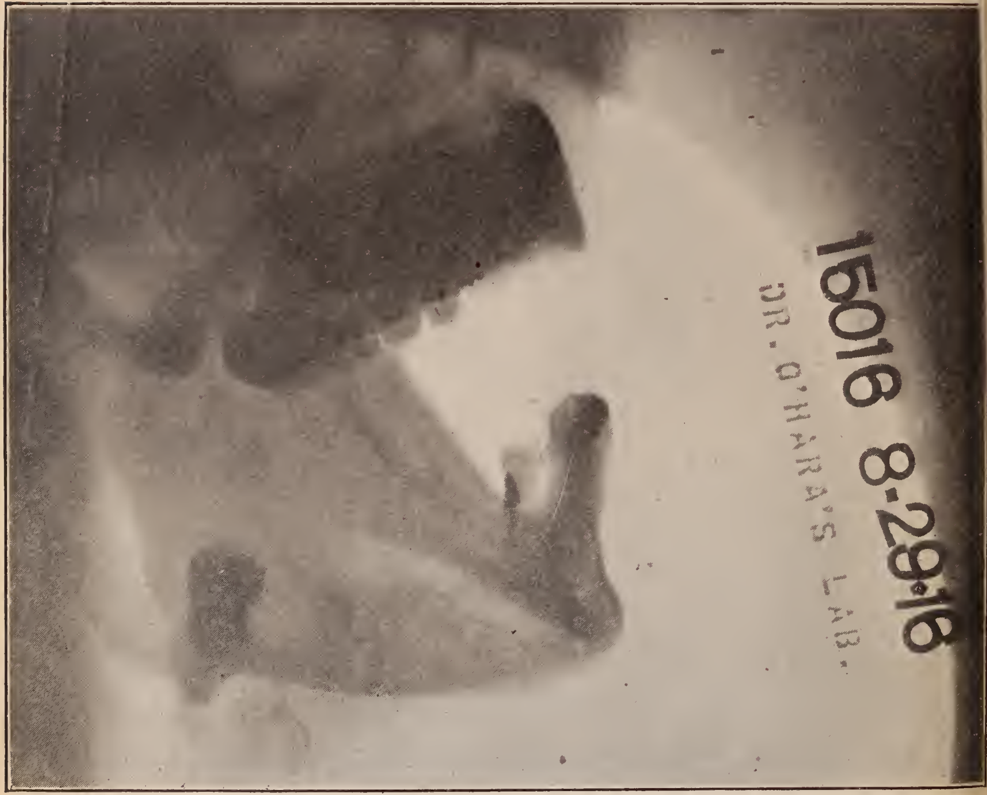
I do not know the time for complete regeneration, but I would put it roughly at a minimum of two years. I have seen bone defects start filling in in eight weeks, but after three months there was but little change to be detected. I would recommend that we here insert a peg and call it "real limitation No. 1." For no matter how perfectly planned the technic, baby bone is transparent in comparison to the denser old alveolar substance. Oh, yes, I can show callus on long bones, but we are conversing about *teeth*.

Dr. Schuhmann in the March DENTAL REVIEW calls attention to the fact that all shadows at the apices must not be considered as abscesses.

Very good. This brings us to a study of the normal tissue or X-ray histology (if I may coin my expression) of the alveolar region. It is further stated that caustic medicaments, *et cetera,* may have produced the rarification visualized in the alveolar cells.

This is, presumably, one of the limitations of the X-ray, when in reality it is a friendly pat upon the back, for it goes to show that the keen eye of the negative light can search out even minute deviation from the normal.

Until I have perfected my phonograph attachment to my newly invented film illuminator (this attachment, by the way, calls out the



This remarkable case was discovered by my assistant (Mrs. O'Hara), and to her belongs the credit of recognizing a condition so rare that the search of available literature fails to show anything similar.

The upper third molar (posterior to artificial denture) is at right angles to its normal position.

The lower third molar has grown downward until its apex has penetrated through the lower border of the mandible.

correct diagnosis when the film is inserted), we must depend upon our five senses and the newer sense of dentists (I refer to the Roentgen ray) for our diagnosis. And again I state without fear of successful contradiction that our sense of seeing and understanding that which is visualized upon the film needs development. Not "lop-sided" development, like the baseball that has been too long at the mercy of a fellow who averages over .300 for the season—but a well rounded out development of the centers of association of sight and of reason.

Impacted third molars are sometimes difficult to depict. It is here that the oblique position, with rays entering back of and obliquely to the angle of the lower manible, grazing the anterior portion of the vertebra and with the affected side down upon a large film or plate, is worth its weight in platium. A sensitive pharynx, or a third molar that has been thoroughly chewed up by inquisitive forceps, will surely appreciate this position. Not only do you get a plate of larger area than could be obtained upon a film, but the shadows are cleaner and less distorted. I make it a rule to check upon my impacted third molar cases by plates in the above mentioned position.

CHECK UP ROOT CANALS.

It is to be hoped that the time is near when a root canal ready for its filling will be "checked up" by means of opaque wires temporarily sealed into the canals. Many a well meaning, honest, conscientious dentist has mounted a post through the side of the root into the process, with resultant abscesses and nerve involvement. I have rayed several persistent "neuralgia" cases, wherein a post into the peri-cementum was the cause.

More than any other aid, is the X-ray is waging war against charlatans in dentistry. A well made film upon which the victimized one can see what has been done to him, is the best object lesson imaginable.

Gentleman, I realize that I am in deep water, when I stand before you and instruct. Not one among you but could present me with the fifteen ball and still win the game. To me, the unknown in dentistry is a great big book, but I have had a little experience along the wayside. I served a weary appreniceship in dentistry in my tender years, but with the advent of my third molars and pinion feathers, I left the dental roof tree. As I look backward, I do not know but I am sorry. When I hear a discussion among dentists, it is like the smell of powder to the old war horse. I like to mix into the discussion and air my views, views that have been packed in camphor for twenty years. And, gentlemen, I can see through the haze into the future just sufficiently far to discern that *some of the discarded practices of twenty years ago have purchased their return tickets.* Some of them are, of course, sidetracked for keeps, but many of them are upon the Wabash, and whilst they may be uniformly late they will eventually arrive.

From the passing age when the extraction of a tooth was an almost justifiable cause for homicide, we are working back to the good old days of *less!* Less what? Less embonpoint, less rhumatoid arthritis, less auto-intoxication, and more artificial dentures. Careful cogitation convinces men that we have gone too far in our conservation of teeth. Old Grandma Gummitt with her complete upper and lower artificial denture is a far better life insurance risk than her granddaughter who sports a jewelers' display in her mouth.

GEN. NEURITIS

Gentlemen, there is food for thought right here. Nature sends decay and pyorrhea. We circumvent them. Ipecac and inlays, pivots and pus, poreclain and pyaemia. *Think it over.*

Thirty years ago I saw the lame, the halt and the almost blind come into my father's office, with mouths full of "snags." Those were the golden days, when the best dentist was he who could extract the greatest number of teeth in the shortest space of time. I have seen these same patients come back in due time for the artificial denture.

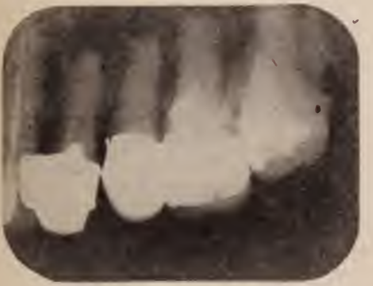
In the interim, said patients had to "gum it" along on soft food and yet the general health improved in almost every case. Why?

I have seen a wrist in full bloom with arthritis settle down to a normal condition, coincident with the successful care of an abscessed cuspid.

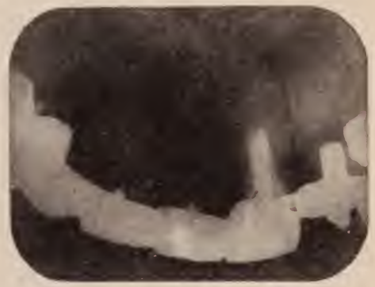
I have seen a case of parenchymatous nephritis clear up when the teeth were properly treated.

It is useless for me to explain the why. You know, I know, he knows, and thanks to the Chicago Sunday papers, most everybody knows the answer.

It is the day and age of miracles. I am no longer astonished.



"RHEUMATISM"



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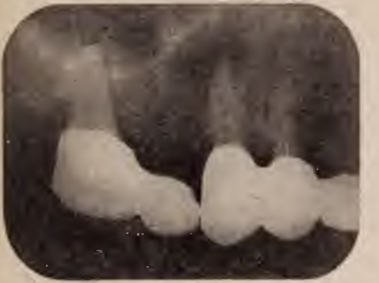
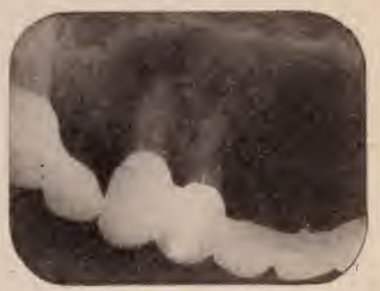


RHEUMATISM



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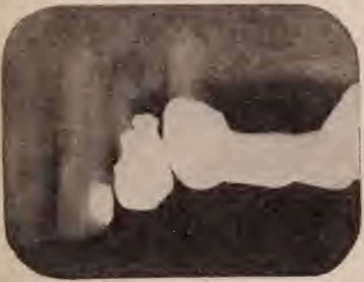
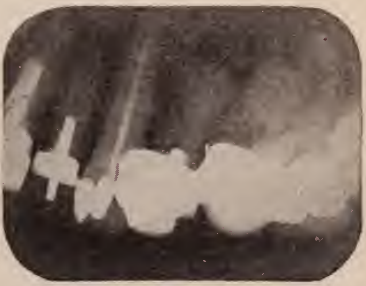


RHEUMATISM



"RHEUMATISM"

Were I to see a pink cow swaying upon the trembling branch of a cherry tree, fanning herself with a roofless plate, and singing in the voice of a Melba or a Tetrazinni, I would accept it as an up-to-the minute demonstration of what could be accomplished.

"Isn't it wonderful" has given place to "will it deliver the goods?" Theory is absorbed by fact, to such extent in the case of the X-ray that we are expecting a man's work from this child of yesterday. And it is not disappointing us.

I am not in favor of the infant size machines that are frequently sold to dental laboratories.

LIMITATIONS IN DENTISTRY.

Twelve hundred milliampere seconds exposure will produce an erythema upon the skin, unless the rays be screened. Keep on the "safety first" side of 1200 M. A. S. The larger the outfit the quicker may be the exposure. Sometimes it is necessary to make several exposures of the same area. Here the larger outfit will do the work with much less danger of a dermatitis than the smaller ones.

STANDARDIZE YOUR SKIGRAMS.

This is a day of standardization. Bring it right up to dental film technic. How? That is your business to ascertain. I am pleased to report that in one year, the Western Roentgen Society has threshed out the matter of general skigraphy, and a standard technic has been adopted by the membership.

Personally I endeavor to give a standard exposure, a standard spark gap, and a standard development to all dental films as well as other work. Further than that, I have a technic of my own in position; a technic that would not appeal to most of you. But when you dentists get together and adopt a standard proceedure, I will try and blend it with *my* work or absorb it in toto.

Appoint a committee—don't make it a large one, for the larger the committee the less accomplished—to take up the matter of standardization. Those of you who have the opportunity of reading the films of various Roentgen ray men, know what I mean and appreciate the need of my suggested reform. Make that committee of bona fide X-light men who make oceans of films, and give them permission to have photographs made of favorite positions, and half-tones of the photographs, and pamphlets printed illustrating their ideas.

Then in a twelve-month they can report back to this cientific body, and distribute a pamphlet that will start the ball rolling toward that goal, sought by all of us who have a mechanical ability—the goal of standardization.

Take the matter of a dental cone. How many of you use it; how much is the cone truncated? What is the angle? What is the ideal angle? The plumber next door to my laboratory and your essayist spent many a pleasant quarter hour building and rebuilding cones for dental skiagraphs. Standardization will avoid the next fellow doing this.

Discontinue the guess work; spoil fewer films and make standard skiagraphs.

If any of you be interested in my technic, I will say that I back up four inch spark and draw 20 M. A. for teeth of persons of light build, especially women, giving exposure of six seconds. For rapid work, or for heavy jaws, especially in the molar region, I draw 30 M. A., backing up five and one-fourth inches spark; Coolidge tube. Wappler Transformer, Standard Transformer, and Scheidel-Western Transformer, are those I use. On this mentioned setting the exposure is two or three seconds. The more detail I desire the less spark gap and the slower the exposure.

I hesitate to mention this for fear of a general cataclysm of laughter, but all my films are made with the patient lying upon the table.

And with my manuscript in the same position, and open for discussion, I thank you for the honor you have shown me, and beg of those who cuss or discuss my efforts to temper the wind to the lamb.

THE GREAT NEED OF DENTAL SERVICE IN THE ARMY AND NAVY.*

BY DONALD M. GALLIE, D. D. S., CHICAGO.

Mr. President, Members of the Illinois State Dental Society, Ladies and Gentlemen: I am sure, every one is disappointed that Major Meyer is not able to be with us this evening. These are busy times for many people in this country and especially busy for many doctors, and our little major is one of the busiest, preparing our men to do their bit. Those who have had the privilege of seeing Major Meyer's pictures have some idea of the terrible conditions that exist today in Europe. He vividly portrays the sufferings of those who are taking part in this terrible conflict.

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* Delivered at a public meeting held under the auspices of the Illinois State Dental Society, May 9, 1917.

When I was invited to take part in the discussion of his paper, I made some little preparation along that line, but inasmuch as he is unable to be with us I will have to change my remarks somewhat. I only learned at 7 o'clock this evening that Dr. Meyer could not be present, and only consented to take his time on the program because I felt that this great war is nearer to me than to any member of our Society, for I have across the line in Canada, a mother who was 86 years of age last Friday and who celebrated that birthday anniversary by finishing her fifty-second pair of socks for the boys in the trenches. In this, perhaps the last lap of her great life race, she has many near and dear to her fighting for the principles so dear to a free people. She has today several grand nephews on the firing line, and four grandsons fighting in the line, in the air, and in the hospitals, and within a few weeks her only American grandson will be on his way to France. (Applause.)

Then again it may be I was invited to open this program, because I have some information about the part my profession is playing in this great conflict that many do not possess. Soon after the commencement of hostilities in 1914 it was evident that the methods of modern warfare would cause unheard of casualties; that trench warfare was most destructive and caused terrible head and face wounds; the demand for surgical assistance was tremendous. To help in this great work the American dentists of Paris and the American dentists in allied countries of Europe started a hospital at Neuilly, France. The call for more assistance was heard bit in the great work of caring for the wounded. As a member of in America and a medical unit early in the war left here to do their this unit we had our Dr. George Meyer.

During the first year of the war I was president of the National Dental Association and I received a great deal of correspondence from Dr. Hayes and Dr. Le Cron with the request that I present the reports at the Panama-Pacific Dental Congress held in San Francisco, in August, 1915.

These reports were terrifying; the descriptions were horrible and demonstrated the great need of dental surgeons at the front. They described how inadequate the service had been; that France had not provided dental surgeons for her armies, and that Great Britain did not know what an army dental surgeon really was. Canada heard the call and there went out from that grand sister country of ours something like 200 dental surgeons, not as a military body but as a professional body. The work they have done is beyond description. In a recent report from one of the great commanding generals of the British Army he said that no men had rendered greater service than the Canadian Dental Corps. Dr. Hayes in one of his reports described the conditions of the mouths of 500 wounded British soldiers that were sent to the hospital from the dressing stations. The vast majority of them had practically no teeth. They were unable to masticate the army rations on account of diseased roots. They were susceptible to all the diseases that were prevalent in the trenches, and their chances of recovery were jeopardized on account of the conditions of their mouths. You may be familiar with the story about the Cockney who went into a recruiting station to enlist. He was rejected. Returning to his pals he was somewhat downcast. They said, "What's the matter, Bill, didn't they like you?" "No, blime the blawsted fellow, he rejected me on account of my teeth. Now, I don't want to bite the Germans, I want to shoot them." (Laughter.) Many of the British Tommies are worse off than the old lady who said she had two things to be thankful for, two teeth, one above and one below, and thank God they hit. Many of the soldiers are not so fortunate.

For many years we have pleaded in Washington for the appointing of dentists in the Army and Navy, with proper rank. A few years ago I was a member of a committee that appeared before the Naval Committee in Congress and made an earnest plea. There were only two members of that committee of fourteen who gave us any kind of consideration, and practically nothing was done until the last Congress passed a bill for the appointing of 500 dentists to the Army and Navy. When war was declared and the reports from Europe told of the great need of dental service, a great cry for help came from Washington. Two dentists for every 1,000 soldiers will be necessary. It means that every graduate from every college in the country who is physically fit must join the Dental Corps; in fact, they request us to keep our colleges going at full speed so that they can look to our present junior and freshman classes for new men. So you see Washington does not expect this war to "fizzle out," as some put it, in three months.

Not only are they calling for the graduates of this year, but they are calling for many of you, those of you who can leave your practices, and those of you who are willing to make the great sacrifice to meet this terrible condition. Every member of our profession will find much to do.

The pictures that are to be shown tonight will undoubtedly depict the sufferings of those in actual combat. The pictures of the wounded will certainly touch every one here; but the suffering of the men on the firing line is not so great as the tortures and suffering of many noncombatants, who today are subjected to all the atrocities of which it is possible to think.

A week ago I attended a meeting in the City of Chicago to hear Ralph Connor, that splendid writer, the author of "Sky Pilot," "Glengary School Days," "The Doctor," and many other great stories. In private life he is known as the Rev. Dr. Gordon of Winnipeg, and in France he is Major Gordon, chaplain of the Forty-third Cameron Highlanders of Canada. He described the destruction devastation and sufferings he had witnessed. They were appalling. In his splendid way he went into the cause of this terrible war, showing it is a war of autocracy against democracy; a war of freeman against the divine right of kings; or right against might. This great fight for freedom had its beginning when the people of England demanded from King John the Magna Charta. The same spirit and the same blood fought for this great principle in 1776 against the Hanoverian King George III; again in 1812, and from 1861 to 1865 the fight was made to make men free and equal in this great country of ours, and again in 1898 this country fought a despotic power to make little Cuba free.

Opposed to the champions of democracy, we have a powerful combination of powers, controlled by a dynasty and backed by a government that stands only for might and the divine right of kings dating back some centuries to the Elector of Brandenburg. This power has been striving for mastery over central Europe. Coming down to the recollections of many here, we are familiar with the policy of Bismarck, and every one knows that the great writers, teachers and theologians of Germany for the past quarter of a century have taught the people of that empire that they were superior to all other people and they should have world dominion. And this belief is held by a majority of Prussians.

A friend of mine who studied three years in Germany used to frequent a little book store in Charlottenburg. One night while in this book store a regiment passed. The sound of marching troops seemed to make the little structure vibrate. My friend turned to the little spectacled book seller and said, "Don't you get tired of this? Are you not sick of paying heavy taxes to keep up this military pomp?" The little German swelled up and said, "Dot is noddings; the dramp of those feet will be heard some day all around the world." And that is their hope. Germany does not care about what she tramps on and over in her ambition to conquer the world.

Major Gordon described the conditions of the country covered by the retreat of Hindenburg's army. He said he had not intended to speak of the atrocities connected with that retreat, but inasmuch as our own ambassadors, Gerard and Whitlock, had given us some idea of the brutality of the German army, he felt that he, too, should give us some idea of the sufferings of the people in that country. Four hundred strong, red-blooded men listened to his calm and earnest description. Not one of us could trust ourselves to speak to the other, so choked were our voices. There is a great difference between the mistakes of militarism and the policy of militarism. In all the wars and in every battle recorded in history there have been horrible acts committed by drunken soldiers and sailors who if caught were severely punished. There have always been such mistakes of militarism, but such is not the case with the German army. Atrocities and brutalities beyond description are the policy of the German government and army. A war of frightfulness is their slogan. For two years and a half our country has done everything to keep out of this conflict. But through no fault of ours we are in it and I know we are in it to a victorious finish. To accomplish this we must make tremendous sacrifices. Our younger members of the profession will enter the army as dental surgeons with the rank of first lieutenant, and I believe before this war is over the numbers will run into the thousands. Some will be connected with base hospitals where they will have a wonderful opportunity of seeing and doing marvelous operations, but the great army of our dental boys will not have a chance to become oral surgeons. Instead, they will be oral scavengers, for judging from the articles I have read and the reports I have received, the conditions of the mouths of the soldiers are beyond description. The soldiers suffer from what is known as "trench mouth." Huddled together for days in filthy trenches, eating with filthy hands, poisoned by gases, trench mouth becomes contagious. Whole regiments are attacked. The gums swell so that the teeth are not visible. They have high fever, sloughing takes place and the pain is so great that the tongue can hardly touch them. To relieve this terrible condition is the work of an army of dentists.

Now, what are we who stay at home going to do? What are you, who are friends of the dentists going to do to help in this terrible struggle? We must do more than support the boys of our own profession. We must go down into our pockets. We must do our bit in every conceivable way to help the millions of men who are fighting this great battle for freedom. To give you some idea of how the people in Canada are supporting their soldier boys, I will take my own city of Toronto as an example. In that city there are numberless organizations working for the benefit of the soldiers, but there is one organization in particular; it has charge of the patriotic fund.

The government pays the enlisted men $33 a month. Those who have any dependents are paid $20 a month from the patriotic fund. Every once in a while this fund becomes depleted, and a campaign is started to replenish. About ten months ago the funds were low. A Give and Serve Campaign was started. They aimed to secure $4,000,000 in four days, and in three days the vast sum was secured. Seven months later a second campaign was started for the same purpose and in two and a half days $3,325,000 was secured. Inside of eight months the stupendous sum of $7,325,000 was given by the citizens of Toronto, a city of about 600,000 population. (Applause.) I do not think there was ever a more generous response to a call than this. What can be done in Canada can be more than duplicated in this great land of plenty. We must go the limit in backing the government and supporting our boys who are not fighting for territory nor trade, but only for human rights.

While we men must sacrifice much, it is nothing to the sacrifices that our women will make. The ties that bind our mothers, wives, sisters and sweethearts to our soldiers are the greatest of all. But I know our American women will unfalteringly face any crisis. They will take their stand with their allied sisters. The women of Canada, Australia and Britain, like our women, have enjoyed all the fruits of happy, prosperous nations for years. No dark clouds have obscured their visions, but not so with the women of France. Since 1871 they have known it was only a question of time before Germany would again attack them. They knew that Alsace and Lorraine were not sufficient. They knew that the German aim was the crushing and subjugating of fair France. They constantly heard the ring of forge and saw the glare of the blast furnaces across the frontier preparing instruments of war. And so when the baby boy of France came into the world the French mother could not take him to her bosom and say, "This is my baby. This is my boy." But instead she could only say, "You are a son of France! You some day will have to fight and die that your country may live."

Men and women of America, we must join France in this great struggle to save not only our sister republic, but all free nations.

Some few weeks ago I heard a wonderful lecture on the "Trail of the Emigrant," by Professor Edward Steiner of Grinnell College. Professor Steiner is the greatest authority in this country on the handling of our foreign population. He commenced the lecture by saying that these are the most momentous times in all history, and you and I are the participants in them. The history of the world today is written in blood. The pages pressed by the wheels of artillery, and the leaves cut by the sword of war. As participants every man, woman and child, no matter what nationality, must be loyal to America. His appeal for loyalty aroused that Sunday night audience so that every one got up and cheered for several minutes. This man was born in Germany and educated in one of its great universities. But he has lived in America long enough to know what America stands for.

The red, white and blue of Old Glory stands for liberty and human rights, and we should feel happy that the flags of our two principal allies are of the same color and stand for the same principles. In these days of trial we must have no slackers; no disloyalty. Every citizen, no matter whether there flows in his veins the blood of Briton, Celt, Slav, Teuton or Gaul, must do his bit, and the native American must lead in this great struggle and show the world what American patriotism means. (Loud applause.)

THE GREAT NEED OF DENTAL SERVICE IN THE ARMY AND NAVY.*

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO.

Mr. President, Ladies and Gentlemen: We have been very royally entertained this evening. The hour is late, and I shall only detain you a short time.

I was impressed, as I am sure all of you were, with the magnificent address of Dr. Gallie. We were also entertained and instructed by watching these films showing surgical operations at the front, and I believe there is not a dentist here tonight who has not been instructed in a very wonderful way (probably a revelation to him), in the manufacture of some of the products we are using every day in our offices.

Now, Mr. President, I want to refer very briefly, if I may, to the significance of dental service in the Army and Navy. Few of us realize what that means. Dr. Gallie has pointed out some of the things connected with it. He made a vivid impression upon my mind, and I am sure he did on yours. As he said, dental service has not been well organized in the armies of the countries in the past, but it is being better organized now. I know more probably about the organization in Canada than I do in the European countries, and I am merely going to refer briefly, not to any statement of a dentist, but a statement of the Premier of Canada in the House of Parliament the other day, when he said there was one unit connected with the Canadian Army overseas that had not received the recognition and endorsement to which it was entitled. He said, "I refer to the dental unit, and I want to announce on the floor of this House that there are today serving in the Army of Canada at least 60,000 men who, without this dental service, would not have been capable of service at all." (Applause.) That is only in an army of less than 500,000 men. Let us take that lesson home to us in the United States. I believe the intention of the Government is to place in active training 2,000,000 men. If the mouths of the soldiers of the United States are in the same condition as those of Canada; and if we have any index from those we have examined, they are in that condition; then that means a saving to the army of the United States with its 2,000,000 men of 240,000 as the result of dental service. That means something for economy in this country. Probably the most vivid lesson in this regard was demonstrated in the Boer War in South Africa, where the British military authorities were confronted by the fact that so many of the men were invalided home on account of faulty mouth conditions. We do not want that to occur in our army, and I wish to say that it is up to the dental profession to get behind this movement. This war is not simply a war of the boys in the trenches; it is a war of every citizen of the United States; it is a war not only of the men, but of the women of the United States. I desire to pay my tribute to the women, as Dr. Gallie has done, and to say something to you that I did not intend to say when I came here.

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*Delivered at a public meeting held under the auspices of the Illinois State Dental Society May 9, 1917.

Dr. Gallie referred to the keen interest that he had in the progress of this war on account of having relatives connected with it. I myself have relatives in this war. The experience of one of those boys comes very closely home to me, and I am going to recite it briefly, since he has gone to the trenches, as it illustrates the spirit that is in some of these boys who are at the front.

I recall very vividly this boy as a little chap at home. He was the last boy I would ever select to make a good soldier. He was a timid little chap. If any one came to the house and he could get away without being noticed he would do so. He did not like to meet people. But he volunteered for the army. He got the drilling and training and, Mr. President, that drilling and training is what the youth of this country needs as well as the youth of other countries. He had not been long in the trenches before he received a severe scalp wound and was sent back to the dressing station. After the wound was dressed he got away from the station and back to the lines, and when his superior officer saw him he asked why he had not remained at the dressing station longer, and the boy replied, "Sir, I felt I was needed here and I came back." It was not long before he was hit again and sent back to the hospital and told to stay there until he was all right. But he got back into the lines again. He was knocked down repeatedly by explosions and one time was nearly buried with debris. He kept on fighting. He was finally put in charge of a bombing raid and was caught in barbed wire and every one of these boys was either killed or wounded. This boy had a wound in the scalp; he had three or four fragments of shrapnel in his back, and something lodged in his ankle. They sent him to England. It took months to put the boy on his feet again and one ankle will never be right. To show the spirit of that boy, when he was injured in the raid and taken back to the hospital to have his wounds dressed it took two men to hold him in his delirium to prevent him from getting back to the lines again. That was the only thing on this boy's mind. When he wrote me from the hospital in England he said, "I have been expecting all the time to get back to the firing line, but my friends have confided to me that I will never do any more soldiering." But he did. When they got him on his feet he went to the front again and they put him in the transportation service, and the last account I had was that he had only been back there a short time before he was gassed. Think of that for the service of one soldier. That is the kind of spirit we need. When I was telling a friend of mine in Chicago about the experience of that boy, he said, "Doctor, you do not get that kind of service where men are forced to fight; you get that kind of service by the voluntary system." I wish it were possible to fill the quota with volunteers, but probably it is not. In the present situation I must favor conscription. I do not believe it is right that one body of young men, who happen to be a little more magnificent in spirit should be permitted to bear all the burden. But I say this: you get a better spirit in boys that have volunteered than in those who are forced into it. I would like to see the American youth volunteer to a man. (Applause.) But all service is not confined to the boys in the trenches. Every one has a duty to perform. Every one of us has a serious obligation placed upon us, and I have the conviction that just as soon as this country awakens to the sublime and fundamental fact that at this particular time this is just as much our fight as it is the fight of the people of Europe, then, I believe every man, every woman, boy or girl, will rally to the standard and place this country once more on the map.

Until recently dental service and dentists had not received the recognition by the governments of the world that we wish we might have, but today we have two dentists appointed on the National Defense Board—Dr. E. C. Kirk, of Philadelphia, and Dr. William H. G. Logan, of Chicago. If we are going to get the kind of recognition from the government that dentists desire, those at home as well as abroad must do their duty with an eye single to the service of the country rather than individual preferment.

As I came down on the train yesterday morning from Chicago and looked out of my berth window and saw the wonderful country through which we were passing, and the bountifulness of nature on every hand, the beautiful farms and everybody apparently prosperous, I said, what a wonderful heritage this country has; and then I was filled with pride when I realized the fact that all the energy, all the ability, all the resources of this country were soon to be dedicated to the establishment of fundamental principles of eternal right and justice. (Loud applause.)

REFLEX DISTURBANCES DUE TO IMPACTED TEETH.*

BY A. H. MUELLER, D. D. S., CHICAGO, ILL.

This subject was chosen by the essayist because it seemed to deal with a field at present in its infancy in dentistry. From the convincing cases on record one would imagine a large amount of material could be found on this subject. Most of the material is in the form of isolated cases presented to the profession because of their interesting facts. The essayist was surprised to learn that in our scientific libraries little could be found written on the subject. He was unable to find a single paper, although he found several on similar subjects, such as "Reflex Disturbances in Relation to Dentition," or "Due to Focal Infection."

The scientific man and even the layman of today is not satisfied with just arresting disease. Progress has demanded that the cause be known. Radiography has upset the theories of the old school and has convinced and opened the eyes of even the most unwilling to the cause and effect of dental lesions. We know that the medical world is constantly asking aid from the dental world in cases where apparently no cause of the disease can be found. To this appeal dentistry has risen with marvelous success. When the big medical man is up against it in finding the cause of the patient's illness his last resort is the dentist.

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*Read before the Dental Review Club of Chicago, May 8, 1917.

A reflex action is the involuntary production of activity in some peripheral tissue, through the efferent nerve fibers connected with it, due to a stimulation of afferent nerve fibers. The conversion of a sensory or afferent impulse into a motor or efferent impulse is effected in the nerve centers. This may be totally unconscious as well as involuntary. For instance, the flow of gastric juice, due to smelling a juicy steak, is an unconscious reflex action. An example of consciousness of the act is sneezing after looking into bright light.

In describing reflexes the older physiologists had in mind only reflex movements. Later they recognized that the reflex act may affect not only the muscles, that is, voluntary, involuntary and cardiac, but also the glands. Today we are trying to find how much of a reflex an impacted tooth can cause, what part of the body it can affect and to what extent.

In the reflex arc, according to the neuron theory, both sensory and motor paths are concerned. The sensory fibers entering through the posterior roots may pass upward through the entire length of the cord to end in the medulla. On the way they may make connection with intermediate cells, which in turn are connected with one or more motor neurons. According to these theories one sensory fiber may establish reflex connections with a number of different motor fibers. Likewise, a sensory fiber carrying an impulse which eventually reaches the cortex of the cerebrum and gives rise to a conscious sensation, may, by means of its collaterals, connect with motor nuclei in the cord or medulla. Thus at the same time it gives origin to involuntary and even unconscious reflexes. For example, painful stimulation of the skin may give us a conscious sensation of pain. At the same time we unconsciously draw away from the stimulant, which may reflexly irritate the vaso-motor center and cause a constriction of the small arteries.

There are three classes of spinal reflexes, namely: (1) simple reflexes in which one muscle is affected, (2) co-ordinated reflexes in which a useful and orderly movement is produced, and (3) convulsive reflexes such as produced by spasm. Stimuli from the interior of the body exert their reactions for the most part upon the plain musculature and the glands. A little strychnin injected under the skin of a frog is soon absorbed, and its effect is shown at first by a greater sensitiveness to cutaneous stimulation, the slightest touch to the foot causing its withdrawal. Soon the response, instead of being orderly and adapted to a useful end, becomes convulsive. The explanation given is that the action of the strychnin upon the central nervous system radiates throughout the cord and acts upon all the motor cells. This supposition of the physiologists leads to this interesting conclusion; namely, that all the various motor neurons of the cord must be in physiological connection, either direct or indirect, with all the neurons supplying the cutaneous surface. It is assumed that in hydrophobia the toxins produced by the disease affect the irritability of the cells in much the same way as does strychnin. Likewise, it is assumed that the sensory impulses from any part of the skin find on reaching the cord that the paths to a certain group of motor neurons are more direct and offer less resistance than any other. It is along these paths that the reflex will take place. We may further assume that these paths of least resistance, as they are called, are in part performed and in part laid down by the repeated experiences of the individual. It is supposed that a definite structure exists in the cord; each sensory neuron is connected with a group of motor neurons, to some of them more directly than to others. We may imagine, therefore, a system of reflex apparatuses or mechanisms, which when properly stimulated, will react always in the same way.

Experiments show that in the mammals co-ordinated reflex movements may be obtained from the cord after severance of its connections with the brain. The spinal cord may be also severed in the thoracic region, below the origin of the phrenic nerves, and the lower animal with care can be kept alive for months or years. The muscles of the body supplied by the isolated part of the cord retain, however, a normal irritability and exhibit no wasting. In man, on the contrary, it is stated that after complete section of the cord, the deep reflexes, such as the knee-jerk, as well as the skin reflexes are very quickly lost, and the muscles undergo wasting and soon lose their irritability. In this respect the monkeys exhibit a condition that is somewhat intermediate between that of dog and man. From these facts, it is evident that in the lower animal, like the frog, a much greater degree of independent activity is exhibited by the cord than in the more highly developed animal. Therefore, according to the degree of development, the control of the muscles is assumed more and more by the higher portions of the nervous system and the spinal cord becomes less important as a series of reflex centers, its functions being more dependent upon its connections with the higher centers.

If one stimulates a sensory nerve trunk directly, for instance, the ulnar nerve at the elbow, the resulting sensations of pain and peculiar tingling in the fingers are somewhat different from the sensations, such as temperature, pain and touch derived by stimulating the skin. Reflexes can also be inhibited. An illustration is the well-known device of inhibiting the act of sneezing by a strong sensory stimulation from some part of the skin. A well-known fact in physiology is that tissues continuously subjected to irritation will finally fail to respond to the stimulus.

The trigeminal nerve is the sensory nerve of the anterior portion of the scalp and ear, of the face, nasal fossae, jaws and tongue. It is motor through Meckel's ganglion to the muscles of mastication, mylohyoid and anterior belly of the diagastric. It is motor to tensor palati and azygos uvalae through the otic ganglion. Through these ganglia, communications are made with the sympathetic system. Communications are also made with the third cranial nerve through the lenticular ganglion; with the facial through the spheno-palatine and otic ganglia, and with the glosso-pharyngeal nerve through the otic ganglion.

Abnormally placed teeth usually give considerable trouble, either early or later in life, the seriousness of which depends largely upon the location and malformation of the misplaced tooth and upon the general condition of the patient. If left impacted, these teeth are liable to prevent the proper nourishment and growth of other teeth, or they may destroy fully formed, hard tissues.

Teeth that have been hindered in their eruption often show pathological changes in their structure. The change may consist in an absorption of the dentin and in replacement of the lost tissue by tissue of an ossious character. They are also liable to and do press upon branches of the trigeminal nerve and produce severe neuralgia in the locality of the lesion as well as in remote parts.

Likewise, they are liable to bring about inflammatory conditions in and about the mouth, causing cellulitis in the tissues of the mouth, neck and throat. Clinical observations by stomatologists, rhinologists, aurists and neurologists have clearly proved that many lesions of the head and face, the cause of which have been more or less obscure, have their origin in abnormal or pathological conditions of dental organs. Impacted teeth occasionally cause disturbances in the nasal cavity, the associated pneumatic sinuses and cells, and interfere with the temporomandibular articulation and likewise interfere with hearing. Often malignant growth of the bone and the surrounding tissues is produced. In many cases where the irritation caused by the efforts of the impacted tooth to disengage itself, or to overcome the resistance to its eruption, an active constructive reaction has been caused in the pericementum, resulting in a hypertophy of the same. In the same manner the pressure upon the bone causes a condensing osteitis, and the bone becomes more dense and obstructive and less vascular.

Most common of symptoms, attendant upon impacted teeth, is trigeminal neuralgia caused by irritation of the malposed tooth upon nerve filaments or trunks. Often the pain is in the form of a heavy rheumatic feeling about the side of the face and jaws. Some cases are accompanied with fever as high as one hundred and four degrees Fahrenheit, enlargement of surrounding glands, and maxillary periostitis, giving rise to heavy, gnawing, and dull, throbbing pain. Occasionally the irritation gives rise to sepsis as well as a quickly forming cyst.

Pulps of other teeth have been strangulated by the pressure of the crown of an impacted tooth. In the same way roots of other teeth have been resorbed. In other cases pulp nodules have been formed through the reflex hyperemia due to the irritation.

The pressure of a third molar against the crown of the second molar may cause decay of the latter or of itself around the point of contact. This may go on until the devitalization of one of the pulps occurs. But before this happens, severe trigeminal neuralgia may be complained of by the patient, and failure to recognize the cause may lead to serious and dangerous operations on the gasserian ganglion. An impacted lower third molar, while attempting to erupt, frequently causes cellulitis, which extends into the region of the temporo-mandibular joint, there causing acute ankylosis.

A large proportion of insanity cases due to dental irritation develop from the age of fourteen to twenty-five. Dementia precox, the so-called incurable form of insanity has been cured by Dr. Upson of Cleveland, by the removal of impacted teeth. He operated on some cases without success, in others with improvement, and in many with complete recovery from this dreadful disease. He suggests that the patient be taken within the first six months of his affliction. His experience has also been that there is very little pain in connection with these mental cases.

Paralysis, epilepsy, imbecility, mental backwardness, defective vision and hearing are all serious afflictions. The evidence available at this time shows that certain of these unfortunate cases are due to dental irritation and can be remedied by the removal of the source of irritation.

All of us have had simple cases in our experiences. Only complicated ones will be mentioned here. An interesting one is of a girl aged thirteen, who was of weak intellect from infancy, but docile and tractable until the period of her second dentition. Then a marked change in her conduct and disposition was observed. She became at times violent and subject to paroxysmal attacks, in which she would run about the room biting at everything within reach, such as chairs, tables and door knobs. In the street she would run away from her attendant and attempt to bite the lamp-posts. Her lower incisors overlapped each other and the cuspids pressed forward at a decided angle. The first bicuspids were extracted. There was no improvement in the child's mental condition, but her biting propensity completely disappeared.

Another case is of a girl aged seventeen, the daughter of a physician. Nothing unusual in the girl's condition had been observed until she reached the age of fifteen. Then a weakness of the lower extremities accompanied by occasional impairment of vision began. This state gradually grew worse, until the power of locomotion was quite lost, except when assisted, and there was complete loss of vision when she assumed the erect form of sitting posture, though in the latter she could see large objects distinctly.. The dental arch of the lower jaw was complete in number except the third molars were only partially erupted. The superior aspect was fully exposed. Still these teeth gave unmistakable evidence of severe pressure against the second molars to the extent of slight outward displacement. The second molars were extracted and within a week a slight improvement was observed. This gradually increased until at the end of three months all disturbances disappeared, except in the vision of the right eye, which was completely lost.

Many of these cases took place before the days of radiography. The essayist is in duty bound to eulogize the skill of the diagnosticians of the past and their wonderful power of seeing through things while groping in the dark.

These cases sometimes involve the ears or eyes. A typical case is of a woman fifty-two years of age, who had for years suffered with tenderness of the left eye and congestion of lids and globe. She finally lost her upper left cuspid which her dentist found to be a deciduous tooth. The permanent cuspid soon followed and when fully erupted her eye trouble ceased.

A similar case is of a girl aged fifteen, healthy in every particular, but was subject to copious lachrymation whenever going out of doors. There was no outward sign of disease, still the moment she went into the open air the tears poured down her cheeks. The upper cuspids were lacking, the arch perfect, and no teeth had been extracted. The first bicuspids were removed, and within a week a manifest improvement was observed. Within three months all inconveniences had disappeared and the cuspids had made their appearance.

Glas of Vienna discovered a cuspid in the nasal floor, associated with calcic growths in its ulcerated surface. The patient was nineteen years of age and had frequent fetid eructations, with vomiting of green, foul-smelling masses. After the removal of the cuspid, the vomiting, etc., ceased.

Along this same type, Marshall of Chicago reported a case. It is of a woman aged sixty-two years who had suffered from facial neuralgia on the right side. This was accompanied by severe otalgia for ten years. In October, 1884, she suffered intensely from what she supposed to be a severe cold in the head. The right nostril became slightly swollen and completely obstructed. A few days after the onset of the cold, during a violent spell of coughing and blowing, she suddenly felt something fall upon her tongue, which, upon examination, proved to be a large upper right third molar covered with fetid pus. There was immediate relief of facial pain. Thirty years previous she had had all her upper teeth extracted. About four years later a tumefaction appeared upon the right upper maxilla near the tuberosity. She consulted her dentist, who could offer no explanation for the cause of the swelling, which disappeared in a few days. Five months before the discharge of the tooth she suffered from an abscess of the right ear, and for several years previous to this time she had a slight fetid discharge from the nose.

A paralytic case is of a girl twenty years of age who had been suffering from severe headaches for three years. These headaches would come on in the morning and disappear in the afternoon. Two years before the operation the left side of her face became numb and stiff, a complete paralysis of the fifth and seventh cranial nerves. At the same time she became partially blind. In four weeks she became totally blind. She had been unable to leave her bed for three months. Throughout her illness she had medical attention, electric treatments and massage. In her mouth were two deciduous upper cuspids. Directly back of them were two hard elevations. Radiographs showed them to be impacted cuspids. The teeth were nearly horizontal in the palate and showed a condition of hyperplasia of the cementum. Sensation and motor activities gradually returned after removal of the malposed teeth.

Many cases are cited where serious pathological conditions have been produced, such as mental disturbances, chorea, tic doloureux, etc., which have been relieved by the treatment and removal of malposed teeth.

A mental case is of a young woman, aged twenty-four, who began to be very much depressed and to manifest signs of failing mental power, typical of dementia precox. Skiographic examination showed several impacted teeth, lateral, cuspid and molar, which were removed. The patient did not complain of any pain in connection with the malposed teeth. Improvement began immediately and steadily. At this time a dentist exposed the pulp of a tooth and capped it without devitalizing. In three days the patient became violently insane and remained so until the tooth was extracted, when improvement began once more.

Another case with no history of a toothache is of a boy aged sixteen. His condition was one leading to habitual criminality. For a year he had been nervous, sleepless and showed much less affection for his family than formerly. His moral sense was considerably blunted, and on several occasions he had appropriated things not belonging to him. He became intractable and punishment no longer availed. His third molars were found to be impacted and were removed. His recovery was rapid, he gaining physically, mentally and becoming affectionate again. Later at college he did good work.

In the following case one or two irritated teeth with dead pulps had given pain, but none of the pain could be traced to the impacted tooth. In this case the patient had been somewhat flighty and erratic for four or five years. Occasionally he would pass into a condition of silly laughter and his talk and actions were incoherent. The upper right first bicuspid was found impacted and was removed. The recovery was uninterrupted and permanent.

Some men claim to have cured cases of infantile paralysis by removing peripheral dental irritation, at the same time admitting that it is an infectious disease. Impacted teeth is one form of peripheral dental irritation. If dental irritation will, through the various ganglia and forms of reflexes, cause disturbances in other parts of the body, it is logic to assume that an irritation of the nervous system caused by a dental organ may greatly prolong and increase a disease of the spinal cord such as infantile paralysis.

Our public institutions are full of individuals who are suffering from diseases and impairments. If correction of dental irregularities increases mental efficiency and saves the public treasury, how much will the citizen as well as the public treasury be benefited by correcting the dental irregularities of the inmates of our insane asylums, juvenile courts, houses of correction, and prisons? Better still, we ought to have compulsory dental examinations of all children.

From the facts of this paper we can deduct that pain is not always associated with impacted teeth; that they may reflexly cause innumerable maladies and that these maladies can be overcome by the removal of the malposed teeth; and that any tooth may cause any of the maladies. Although dentition is usually complete by the age of seventeen, reflex disturbances due to impacted teeth may come at any time in life.

In closing, the essayist wishes to make a plea to those who have the opportunity to see and treat these cases, to write about them so that the rest of the profession may be benefited thereby. Certainly there must be many of these cases in our public institutions as well as those which we meet in private practice.

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THE BIG WORRY.*

There are many unpleasant situations forced upon a dentist by the nature of his employment. These may include anything from a tortuous root canal to a hysterical patient. The dentist, however, is expected to throw such trifles aside and keep a cheerful face. This he is usually able to do until he comes up against a real worry.

The real worries may also take many forms, such as financial loss, failing health, or a failing practice. For downright wretchedness, a malpractice suit wins the prize, and will sink a cheerful philosopher into a deeper grave than that of any ship blasted by a submarine. This, then, is the Big Worry, and let each one of us hope that it may pass us by.

In all the professions there are none who suffer more from a lawsuit than does the dentist, and this the shyster lawyer well knows, and welcomes the opportunity to take advantage of the fact. A prosecution of the dentist falls like a bolt from the blue, and usually catches him unprepared. Thus it often happens that a reputation which it has taken years to acquire, by dint of hard toil and study, is dashed to pieces by some unfortunate circumstance that might easily happen to any one of us. In cases of this kind, where so much is at stake, the dentist needs the assistance of the very best legal talent that he is able to procure. The average country lawyer is incapable of handling a case of this kind successfully, without expert counsel, and the means should be at hand whereby he can secure such service. To this end many dental societies have established Law Committees to cope with this problem.

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* A Statement by the Law Committee of the Illinois State Dental Society.

We believe that there is not a single dentist in America that does not hope to see this evil eradicated, but just how to proceed has been the question. If it costs too much for this protection, most dentists will pass the matter up, hoping that, if trouble comes, it will be to the other fellow. Such an attitude is exceedingly pleasant to the shyster lawyer, for it means fat pickings for him.

Malpractice suits are costly and injurious to the profession. Our work, like the physician's, is such that all the factors relating to it can not be positively controlled. We are working on living tissue subject to change. Work done conscientiously under difficult conditions, might later on be criticised as improper. We owe it to our profession to be careful in making statements that might be wrongfully interpreted. When patients of a fellow practitioner present to us for treatment, we ought to keep in mind the Golden Rule. Anything which tends to bring about a better understanding of our legal liability and a better co-operation for the prevention of wrongfully instituted malpractice suits, on the part of the profession, is a step in the right direction.

The Illinois State Dental Society, at its last meeting in Quincy, instructed its Law Committee to prepare an outline of the issues involved, and the best methods for working them out. The Committee was further instructed to have this paper published in the DENTAL REVIEW, the official organ of the society, so that members of the society may know the situation. This matter is rather serious at the present time, owing to the fact that of the various dental operations so few have been standardized. So important a matter as root canal filling is a matter of confusion. At the Quincy meeting a leading educator outlined a method of root canal filling. An equally eminent practitioner agreed with the writer on just about two points, one was that it was a very important operation, the other that it should be handled under aseptic conditions. As to antiseptics and methods they were at odds. Now, if the big men can not agree, what about the rest of us? Just how much dependence shall be placed in the reading of the X-ray, is another mooted theme, all to the great joy of the prosecuting lawyer, who must have his flaw on which to hinge his suit.

If the dental profession is to be protected against illegal malpractice suits, it must be either through protective insurance companies, or through collective action by the dental society.

To gain protection through an insurance company means an expense of about fifteen dollars a year for the policy. This includes lawyer's fees, court costs and judgments in case the suit is lost. Of recent years there has been a movement on foot among some of the State Societies whereby their members get a policy of this kind for ten dollars a year, provided that a certain number are taken.

Your committee believes that at present we should continue as we are now doing by assisting in defending suits, and when the time appears to be propitious, to follow the example of certain medical societies, who furnish protection to their members at a very nominal rate. In this connection the history of a certain State Medical Society having six thousand members is interesting. This society began twelve years ago to defend its members, at a cost of one dollar a year per member, which was collected with the dues. During the first eight years "there were approximately two hundred eighty-five cases. This included anything from a mere complaint up to an actual lawsuit. About seventy-five cases were defended in court either in whole or in part. In some instances there was no trial but a judgment was entered by default. These were all counted as suits. We had approximately sixty pitched battles in court. These were all won either in the trial court or on appeal, with the exception of one case, in which a verdict of one thousand dollars was returned against two physicians." The committee had about one thousand dollars to start with, paid all court costs and lawyers' fees, and at the end of the eight years had nine thousand dollars in the treasury.

During the remaining four years there have been three cases lost, and the surplus has increased to about twelve thousand dollars. Now, if a medical society can defend its members at a cost of one dollar a year per member, it is foolish to deny that a dental society can do the same. There is constant agitation among members of the profession for this kind of protection, and eventually our societies must come to it.

The small cost, of course, is due to the economy effected in collection of dues without resorting to advertising, agents, and expensive salaries. The legal firm employed by this medical society informed us that since the liability of a dentist was so much less than that of a physician, that a committee of this kind in a national society could insure all of its members at a cost of fifty cents per member per year, paying all lawyer's fees, court costs and judgments in case of defeat. While these figures have been questioned in some quarters, yet the firm above quoted served as counsel to a protective insurance company, and their opinion is of merit. The facts speak for themselves in the experience of the medical society protecting its members, and we can do the same any time we get the notion strong enough.

In any event one dollar a year per member defended the physicians and will do the same for us. It left them approximately one thousand dollars a year surplus, above expenses. Now, while the medical society did not pay any judgments where cases were lost, it could easily have done so, if they had charged two dollars a year per member. The extra dollar paid out by each of the six thousand members for the twelve years would have amounted to seventy-two thousand dollars, even if we did not include the accumulation of interest. It is doubtful if all the lost judgments would exceed twenty-five thousand dollars in that length of time, so why pay more? We are certainly as able business men as are the physicians, and our liability not nearly so great. The National Dental Society has not the funds at present to engage in this work, and when that time comes it will be expedient to handle this matter in a large way rather than by state societies. When such a time comes we will get our protection at the exact cost, and the Big Worry will have become so unpopular that it will have only a feeble existence, if any.

(Signed) C. B. WARNER, Chairman,
W. H. KARCHER,
J. E. SCHAEFER,
Law Committee.

STRAWBERRIES.

BY DR. E. F. SCHEWE, ST. LOUIS, MO.

It was strawberry time in the Ozarks and my friend had acres of them ready for the pickers. Acres of strawberries with blushing faces peeping out from their cozy hiding places under the rich foliage all radiant in the June sunshine—it was a beautiful picture. Just as my admiration reached its climax, my friend handed me a gallon measure, saying: "The right of way in these hills is yours—pick for yourself and enjoy." With bows and wreathed smiles I hastily accepted his princely proposition.

Accordingly I proceeded leisurely to pick the largest and most luscious berries I could find until the vessel was well filled. Returning to the house I supplied myself with certain requisites and then followed a winding path down a gentle incline into a wooded glen to the springhouse which nestled in a little wilding place against a rocky hillside. Upon opening the door a cool, comfortable atmosphere, laden with the odor of cow's milk, was wafted toward me with agreeable surprise. The splashing of water, emanating from the rocky wall attracted my attention; it was a tiny cataract singing its anthem to a dull world. On the rocky ledge beside this miniature Minnehaha I spied an old-fashioned gourd dipper which seemed to invite me to a refreshing drink in language more eloquent than "the rill of the town pump." Holding the dipper under this dashing cascade, the water bubbled over and over and fell splashing upon the rocks at my feet. As I slowly drank the pure, cold liquid I began to understand the poet's rapture over "the old oaken bucket that hung in the well." And as the second gourd full followed I felt certain that compared with an old-fashioned dipperful of crystal water in that Ozark springhouse the sparkling cup of Edward Fitzgerald's Omar would ever be wholly negligible. I next took my vessel of berries and subjected them to a cold cleansing shower bath beneath this wild foaming cataract. Side by side along the babbling rivulet of crystal spring water and partially emersed in it sat jars and crocks of varied shapes and sizes. Curiously uncovering one of the crocks, there appeared the richest yellow cream that the eyes of an ordinary urbanite had ever been privileged to look upon. It was strange, but somehow there rose before me the vision of contented milch cows lounging under great shade trees. I seemed to hear the call of the bobwhite, the rapturous carol of the mocking bird, mingled with the laughter of children and the song of berry-laden youths singing "The Harvest Home."

Finding a wooden ladle among the crocks, I skimmed the cream into a vessel, washed the ladle in the limpid stream, recovered the crock, and with my treasures emerged from the cool, damp atmosphere of the spring house into the sunshine without. Looking about for a solitary nook where I might abandon myself to my gustatorial pleasures unobserved I finally nestled in a cozy fence corner under a great spreading oak. Several frightened squirrels, disturbed at their suppers, scurried to the nearest tree and nimbly scaling it, disappeared on the opposite side. A little thrush, perched in a thicket on the slopes below, was cloyally singing its sweet solo to the skies like a veritable Gluck of the forest, while the gentle breezes were wafting the tinkle of a cowbell from a distant meadow across the valley. A great white cloud was drifting across the far heavens like a stately ship sailing the boundless deep. The shadows of giant trees like monstrous specters were slowly climbing the rocky slopes as the sun was retiring grandly behind golden-fringed curtains in the west.

Just then the clamorous peal of a bell at the farm house rang out in the still evening air—no doubt it was the cook's first call to the laborers in the field. Carrying my basket to the stump of an old tree the flat surface of which served as an improvised table, I proceeded playfully to pile the most select berries on an ample dish in the form of a miniature Ozark foothill. Then taking a jar containing pulverized sugar, I boldly dug down into this again and again with a spoon and scattered the sugar on this hillock of berries. For the world it resembled a snowcapped mountain. Then taking the vessel containing the cream, I gently poured it on the summit of this miniature Matterhorn. As it trickled down the sides some disappeared in the fissures and gorges and cañons, while the main currents, bearing before them avalanches of snow-white sugar, completely flooded the ravines and valleys below. It was exquisitely attractive. And then what followed? Well, I had heard or read somewhere that "Nature abhors a vacuum." Whether this axiom is scientifically accurate or not I did not wait to establish. Somehow I felt, and keenly felt an irresistible pull which made this natural law—if law it be—seem quite rational. Accordingly taking up a good sized spoon in my right hand I proceeded to—but words fail me here. If you do not know, I cannot make you understand. However, as this dainty heap of toothsome deliciousness was slowly but surely hidden away in the spacious depository of my epigastric economy I felt an inexpressible relief in the consciousness that there was no sullen hypochondriac about who might have remarked: *"Bah, I would prefer prunes."*

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-THIRD ANNUAL MEETING, HELD AT QUINCY, MAY 8-11, 1917.

DISCUSSION ON THE PAPER BY DR. GILMER.

Dr. William H. G. Logan, Chicago:

Mr. President, I will only discuss one point covered in the paper, and that is the question of root amputation; and why do I select that question out of a paper which is full of good ideas? First, because I agree with the statements made throughout the paper; second, because we find dentists all over the country gradually reaching the conclusion that it is a wise procedure to amputate practically all root ends when there is a disease beyond, and because they hear nothing more of that tooth, the case is thought successful and treatment has been ideal. Therefore, a statement, it seems to me, should be made by the various men who are really active in this line of work. I shall state the indications and contraindications for the amputation of root ends as I see them. Although I have been amputating root ends for a period of twenty years, I have not followed up the cases with radiographs with a sufficient degree of constancy until the last three years to state in what percentage of cases I have been able to secure temporary or permanent eradication of the chronic infection at the root ends which had occasioned the surgical interference; therefore, in my estimation, what I here record is of small value.

All root ends about which there is a chronic infection, the apical pericemental membrane destroyed, and the root ends absorbed or not absorbed, are in a condition calling for either extraction or root end amputation, basing the choice upon whether more or less pericemental membrane over the root has been destroyed.

Indications: Patients must be in good health. Where the involvement does not exceed one-third of the root length of any of the ten upper anterior teeth or the eight lower anterior teeth. All other teeth, if amputated, I look upon as less favorable. The tooth must contain a perfect aseptic root canal filling beyond the point of amputation.

Contraindications: Root amputations should not be performed on patients suffering from a severe secondary involvement which you have reason to believe was caused or influenced by chronic focal infections. Root ends should not be amputated beneath the antrum that give a history of chronic infection past or present. Root ends should not be amputated if that portion of the root which is to remain contains a bacteria laden or a defective root canal filling. Root end amputations become less favorable as the bone involvement extends in any, direction from the root end more than one-third the length of the root. Whether it is good practice to close the wound by suturing can only be answered after a sufficient lapse of time to gather the evidence demanded. At the present time the success of root amputations is in a position similar to that occupied by the root canal problem about five years ago, for at that date the profession felt that if a root canal was filled, so long as the tooth remained comfortable, therefore the operation was a success. At the present time many of those performing root amputations are basing their opinion of successes upon the fact that the tooth is comfortable or upon radiographs of a few successful cases which only cover a small percentage of all roots amputated. In other instances we find men rushing into print in a few months or a year or two at the most after they have started to do the operation, or have changed their technic, and claiming from 90 to 100 per cent successes, presenting radiographs showing partial filling in of the bone changes, but this is only partial proof of the ultimate outcome. At least five years, or better, ten years, will be required to determine the probable outcome or to furnish absolute proof that the infection is eradicated and does not return. The exposed surface of the root at the point of amputation, which is never covered by the pericemental membrane, so far as our present knowledge is concerned, leaves a very weak and questionable point which may favor the return of the infection in too large a percentage of cases when the patient comes to a degree of lowered resistance to warrant the continuation of this type of operation. The propriety of root end amputations will be more thoroughly understood five or ten years from now, for this amount of time will be required for the conscientious, painstaking man who has the training necessary to assist in arriving at a correct conclusion. Following the above outline, I am amputating the root ends in the most favorable cases and extracting the others until the necessary evidence is furnished to cause one to discontinue the practice or to advise this operation.

Dr. Donald M. Gallie, Chicago:

I am sure that every one present this afternoon feels encouraged and has some hope that they will be able to handle these very difficult questions that have been bothering us for the last two years. What a splendid confession our friend, Dr. Gilmer, has made this afternoon when he tells us that he cannot tell what to do with pulpless teeth, and then he further tells us it is because we have not sufficient data to guide us. I only wish that this auditorium were packed with members of our society. It is some satisfaction to know that every member of this society will read Dr. Gilmer's paper because they know that any contribution he gives to the profession is worth reading. I only wish every dentist in the country would read it, and I wish every medical man could have heard it, and our commercial radiographers, because they are the ones who think they can tell us, after taking an X-ray picture, good, bad or indifferent, what should be done with pulpless teeth. Yet this afternoon we have a master in this line who tells us that with all his experience he is unable to tell what to do with some pulpless teeth. I admire the splendid way in which he differentiated between a pulpless tooth that is comfortable, or is not diseased, and the one that is diseased. This should guide us because he has made it plain to us that a tooth that is abscessed is a great menace, while one that is pulpless may be comfortable and is not necessarily a menace to the life or to the future health of the individual.

I am very much pleased that he presented the question of susceptibility and immunity so well, because that is such a large factor in the consideration of this important question. The susceptibility of a person to different kinds of disease has much to do in guiding us in the treatment of these cases. A robust, healthy, husky person comes to us and by pictures we see a condition that is rather suspicious. I think we can be a little more daring, if I may use that term, or we need not be quite as concerned with the future of that case as we would be with the anemic and the sickly and the patient with a bad history. Dr. Gilmer has given us a splendid and lucid explanation of the questions of susceptibility and immunity, and it should be a great aid to all of us in the future. A few years ago we were divided into two camps and were rather hostile towards each other. This was largely because we did not have information and guidance from men like Dr. Gilmer. Too often the conditions are judged from the X-ray picture rather than from a careful examination of the mouth, and Dr. Gilmer takes strong ground when he states it is a great mistake to be guided by pictures alone because they are so often misleading and they must be accompanied by a careful examination of the mouth.

I was glad he spoke of the conditions of the teeth of patients who come for treatment of pulpless teeth that have been treated. According to the X-ray, they have not been properly treated; that is, the roots were not filled to the apex. There may be a millimeter of space where the root is not filled, and yet there is no sign of trouble at the apex of that root. I do not know whether he would disturb that canal filling or not, but my idea is that we are liable to do harm by going into a root canal of that kind, removing the canal filling and then probably finding it was filled as well as any one could fill it without drilling the rest of the distance to the apex. So what Dr. Gilmer meant to convey to us was that we should leave well enough alone. We all know some of the roots that are well filled are the ones that show signs of trouble. It is a serious problem to determine whether there is an abscess at the apex in these cases in which we find a darkened area or whether it is a trick of the X-ray. There are so many things that have an influence upon the picture of the roots that it is difficult to interpret the X-ray as it should be.

I was glad Dr. Gilmer emphasized strongly the necessity of being careful before we devitalize teeth, and I was also glad to notice the emphasis he placed upon the question of denuded roots whether they are vital enough to allow them to remain in the mouth, or whether they should be extracted. That puts a crimp in the advocacy of saving any of these old derelicts that have been splinted and held in as thorns in the flesh for years.

It is encouraging that we have had this paper. It gives us some hope and guides us in the right direction. It is not radical but rational, and we will go back to our respective locations and do this work with some hope of succeeding because it does not look quite as dark or as difficult as it did a year or two ago.

Dr. E. J. Perry, Washington, Iowa:

Mr. President, I am willing to say that I do not know very much about pulpless teeth; I do not know how many people I have killed, and I am glad I am going to soon quit. I think with Dr. Gallie that there is a whole lot of unreliable information concerning the roots of teeth, and it did me a lot of good to hear my friend, Dr. Gilmer, call time on radiographers.

I did not expect to say anything on this subject, and it is impossible for me to say anything of value as a contribution to this discussion. I notice that all who have spoken have said about the same thing, and with Dr. Gallie I think we had better wait until we get more definite information. It is a discouraging thing to undertake to fill a root canal and square yourself with your patient. We do not knew, the radiographer does not know, and who in the world does know?

Dr. Edmund Noyes, Chicago:

I am very glad, indeed, that we have listened to this paper this afternoon, and I congratulate the society upon the fact that we have had so wide a view of the subject presented; that the essayist does not look at one point and determine the whole question on that. There are one or two things that are in my mind.

It is true, as Dr. Gilmer has said, that we do not quite know what to do with pulpless teeth, that is, the problem concerning them is not solved yet completely. On the other hand, you and I and every one of you have got to do something with pulpless teeth every day of our practice. So in the meantime, before we know all about it, we must use what knowledge we have with the very careful observation, thinking and judgment that we can bring to the question.

One of the most important things to my mind, in view of the whole development of questions relating to metastatic infections, the development of systemic diseases from local infections, is the question of what changes in the routine average practice by the members of the dental profession are necessary and called for in view of this—I won't call it new knowledge, because fifty years ago people knew that a man sometimes got over rheumatism after losing a diseased tooth, but the scientific demonstration is very recent. How are we to handle these cases differently in view of what we know lately and from what we have commonly thought possible for thirty or forty years. The first thing in my mind is that root canal work must be done with a great deal more care and thoroughness by the average man; I will not limit it—I will say by all men and count myself, too. We should use more care and thoroughness than we have heretofore bestowed upon that operation, and a question which was constantly in mind was, that when we pleaded for more time and more care and more skill in these operations, it was said by dentists: "I cannot afford it; my patients will not pay for it." This new knowledge has put the answer to that in our hands. All we have got to say is that neither you nor I can afford to take the chance of a heart lesion, an arthritis that will deform the hands, a stomach ulcer that will give you a long illness, etc. Neither you nor I (speaking to a patient) can afford to take any chances of these consequences if we can possibly avoid them by any labor we may put in on it or any money that you can pay, and I am sure patients will respond to that appeal because the evidence now is unquestionable. Twenty or thirty years ago they could say, I don't believe it, and you could not bring positive proof; but now you can. That is the first thing that must be different from what has been done in the past.

The next thing is an entirely different attitude towards the tolerance of diseased teeth in the mouth. We have all seen teeth with chronic abscesses that discharged occasionally for three or four, sometimes eight or ten or twelve years, the persons enjoying average health during all that time and apparently the chronic abscesses causing no particular trouble. The teeth themselves were certainly comfortable and usable all the while, and we used to think lightly of such things compared with what we dare think now, and the broad statement that a diseased tooth must be cured or removed must be lived up to as we have never lived up to it before, and I am not quite sure that there is any exception to that rule.

I am very glad to have heard the statement that diagnosis should never be made by the X-ray without a clinical examination of the patient. Too many people, both radiographers and physicians, and some dentists, have seemed disposed to throw away all the clinical experience we have had with the treatment and management of pulpless teeth and depend upon the radiograph and nothing else, and that warning has been sufficiently given. I need only add to it that the radiograph will not with any positiveness differentiate between an apical space in which there is an acute or chronic abscess and an apical space in which there has been an abscess that is cured and is in process of filling up with healthy tissue.

There is one aspect of the question of root resections that I would like to ask a question about. I have often thought of it as related to the operation which we used to make occasionally of replanting or implanting, and a frequent experience of those implanted or replanted teeth was that they remained apparently healthy, but after a time, say six to eight or ten years, they were shed like temporary teeth because the roots had been absorbed. Now, that very method of loss indicates that there has been a physiological condition there, that there has not been disease because the absorption of the root of a tooth is a physiological process and not a pathological one. I have often wondered in what respect the end of an amputated root as regards the prospect of absorption differed from the end of an implanted root, and whether some of the roots of these resected teeth are going to be lost by absorption. I do not know of any history that will answer that question.

Dr. Charles E. Bentley, Chicago:

We are in the trenches so far as this subject is concerned, but this paper affords us a way out, as I take it. Dr. Gilmer told me coming down on the train that if he ever felt like making an apology for presenting a paper before any dental society, it was this paper that he has presented. Of all the papers I have heard Dr. Gilmer read, and I have heard him read many, I do not know of any that has the stamp of rationality and conservatism as this paper read this afternoon. For, Mr. President and gentlemen, as Dr. Gallie says, we have had the utterances of a master, and what has this master told us? He has been absolutely ultra-conservative in his opinion. Why should he be ultra-conservative? Because we have not sufficient information on this subject to get a perspective or to come to any positive conclusions. Hence the four classifications he has given to us, in my opinion, should be a basis for practice until we have a greater number of facts to formulate a definite theory. They give us a great opportunity and greater facility for working out these problems along a very definite and practical way in our offices. There is one thing that has been brought to my attention very forcibly after listening to this paper, and that is, in one of these classifications he says that if the apices of teeth are denuded of peridental membrane to any great extent they are going to be lost; such teeth should be extracted; they are a constant menace to the health of the individual.

Now, I don't want to throw mud at radiographers. I know radiographers have been like all the rest of us; a great tidal wave comes along and we are swept along as so much driftwood and run to extremes just the same as other human individuals. So is it with radiographers. If these denuded teeth, although they appear to be good from the outside, are a menace, they should be extracted. I want to know how these denuded roots are to be detected, and the only way I can see is through radiography, unless we can take a stiff probe and run it through the alveolus and explore around there in this rough space and find out whether the membrane is denuded or not; still that would be a rather uncertain, if not an unscientific, method.

Dr. Buckley: Is a radiograph positive?

Dr. Bentley: No, it is simply an accessory that will aid us very materially. A radiograph is the only means I know of which will reveal that condition, and that is the one thing I think Dr. Gilmer ignored or omitted in his four classifications. It is the one thing I want to know about, and if I take nothing else from the paper I can take that.

My conscience will feel the better when I find out, as he states, that one-third or two-thirds of some of these mesio-buccal roots, or any of the roots of lower molars are occluded or are blocked up with secondary dentine, and we cannot get far into them. I will take my chances with a healthy individual in filling these roots as best I can, and rendering service to that patient.

I think, Dr. Gilmer, the four classifications you have made will become classic. Certainly I have not seen anything in print to equal it, and instead of being your worst paper, I consider it one of the best papers you have ever read.

There is one thing that no man who has discussed the paper has touched upon, and to me it is one of the startling propositions in the paper. What he says at the end of the paper is contrary to my teaching and to my traditions, and contrary, I believe, to the major portion of the understandings of this group of men. He says, if I understood him correctly, that alveolar abscesses are more often caused through the blood current than through the pulp chamber or root canal. Am I correct in that?

DR. GILMER: Yes.

DR. BENTLEY: That is a new proposition to me. I am surprised no one has taken it up.

I simply want to say in closing, that this to me is an epoch making paper and ought to do a great deal of good, and I hope the dental profession throughout the length and breadth of this land will read the conservative statements of the essayist of today.

DR. JOHN P. BUCKLEY, Chicago:

I do not know wheather I will make as many confessions of my ignorance on this subject as my friend Bentley did or not. I have always felt that when a man refers to things he did years ago, it shows he is beginning to feel old. I was reminded this afternoon, as I heard one of my friends discuss this paper, of a paper I read before the Chicago Dental Society in 1902, entitled "Whither Are We Drifting In Therapeutics?" And one of the things I argued against was the use of such preparations as zinc oxid—formaldehyd pastes in the filling of root canals. One of my old teachers and friends criticized me that evening because I offered no substitute for the remedies I had condemned. A day or two after that I received one of the sweetest and nicest letters from Dr. E. J. Perry that I ever have received, and I have that letter among my keepsakes today. Someone had told the doctor that his criticism wounded my feelings. It did not, but I appreciated the letter nevertheless.

This paper, ladies and gentlemen, to me is the most logical and rational of any paper I have heard along this line from what I call our medico-dental men. I have heard rational papers from dentists who had not the M. D. degree, but the men in our profession that have been most radical, as radical as most medical men, have been the men in our profassion that possessed both the M. D. degree and the D. D. S. degree. There are a very few of these men who have been conservative, and Dr. Gilmer is one. But this paper today, I say again, is not only conservative but is the most logical and the most rational of any paper I have heard along this line.

Recently I was on the Pacific Coast. The dentists there when they saw some of my slides, wanted me to meet the medical men.

They wanted one medical man in particular to be present, and he was, and after he saw the slides I had shown that night, he came to me and said, "Dr. Buckley, wherever you go, you ought to ask medical men to see these slides, because we are just as deeply interested in this subject as are the dentists. He said further, "I had no idea that teeth like you have shown and described tonight could be treated and saved or put in such condition as not to become a menace to the health of the individual."

The one thing that was most disappointing to the dentists on the Pacific Coast was the fact that I refused absolutely to operate on the 15 or 20 cases that they brought to the clinic for root end resection, and I refused because before I went there I told these men that I would operate on all cases they brought if the tooth was one that had been recently treated, the canal of which was sterilized and filled with a gutta percha root canal filling. The cases they brought to me and expected to have cured by the operation known as apicoectomy were those where the root canals were gangrenous or half filled with some root canal filling material.

I wonder if you caught that classification in Dr. Logan's remarks where he said, you must cut off enough of the root end so that you will come down to a canal filling which is sterile; otherwise you are going to fail. I think I have cut off as many roots as any man in this audience where the operation was contraindicated—contraindicated because no one told me, and until the last two or three years I have not told any one else, that the operation was contraindicated in cases where the tooth has an infected canal, and many a time have I operated, as Dr. Reid has done, perhaps where I did not cut down to a root canal filling which was sterile, and who can say that you can have a canal one-half of which seems to be filled well and the apical end has no filling in it at all, without the entire canal being infected. If you have a tooth that is solid in the jaw, the canal of which has been recently treated and filled as some of us want it filled, you can cut down to healthy bone around the entire periphery of that tooth, and if you have no pyorrheal pocket alongside the root, your operations will not be 100 per cent failures.

We did not know so much about focal infection and systemic results three or four or ten years ago as we do today.

Ladies and gentlemen, I would travel from San Francisco to New York City to hear this paper by Dr. Gilmer this afternoon.

I would not change a single line, nor a single thought, in it. I do not think Dr. Gilmer used an ambiguous word in his entire paper. Dr. Gilmer is one of the honest, conscientious, thorough men of the dental profession. I am not saying this for applause or because Dr. Gilmer is here; I am saying it because I believe it and know it is true. There is no man that I know who is better qualified to discuss this subject from a scientific point of view than this man to whom we have listened this afternoon, because he has studied the subject not only from a pathological standpoint, but more particularly from a bacteriological standpoint, and I believe the only reason Dr. Gilmer felt like making an apology this afternoon was the fact that he did not have as much bacteriology in the paper as he is capable of putting into it. Nevertheless, it is a good paper, and we know that Dr. Gilmer has that reserve knowledge of the science of bacteriology on which the paper was built. I thank you.

A MEMBER:

Dr. Buckley mentioned putting in a sterile root filling in cases where amputation was indicated. I would like to ask him how long that root filling remains sterile under these conditions.

DR. BUCKLEY:

I amputate at the time I fill the root.

DR. W. D. N. MOORE, Chicago:

It takes some courage to attempt to make any remarks upon this subject before an audience like this. For the last two or three years I have been entirely at sea and have had to apologize to myself for the unsettled mind I was in as far as the practice of root canal work was concerned. I have talked with other men, and I never could get myself to know exactly where I stood in regard to this question of root canal work, due largely to the literature I have read and to the ideas that were expressed wherever dentists met.

Today, after hearing Dr. Gilmer's paper, it has given me a clear vision of this work, and I want to thank him for it. It seems to me that his paper serves as ballast and brings us back to a better state of equilibrium than anything I have heard or read in the last few years. I feel more encouraged and think I am able to do some good in handling pulpless teeth. In my past experience it has seemed to me that work very poorly executed has been most accountable for this trouble of abscessed teeth. Root canals that have been thoroughly sterilized and as well filled as possible have given good results in most instances, and it is due to the really poor attempts at root filling that so much has been said against all root filling operations.

I have referred a number of cases to Dr. Buckley for root amputation. I filled the roots, as I told him, and sent the patients to him. I have known many of these cases to be entirely successful. He has amputated one root of molars where you would not expect as much success as you would from a single rooted tooth, and with the very best results. These teeth have lasted four or five years and are in apparently good condition and as far as practical service is concerned are as perfect as they ever were. I can get the evidence from these cases any time.

I want to thank Dr. Gilmer in behalf of the younger men for his valuable paper. His paper has given us a foundation on which to build and to be rational in this work.

Dr. F. F. Molt, Chicago:

I want to say a word or two on Dr. Gilmer's paper inasmuch as every one has taken a shot at the radiographer today. The Chicago men with whom I work will acknowledge that as radiographers go we are of the conservative type and that we take into consideration the history, clinical conditions and so forth, of our cases.

I want to pay my respects to Dr. Gilmer on his paper today for having collaborated with him in several cases I have found that we thought a good deal alike.

I want to mention a case of root amputation in which I was both the perpetrator and the radiographer. This was a case of a young man I had in general practice some 12 years ago, and this case came to me the other day, an old patient of mine, for whom I had inserted a good deal of bridge work and some detached post crowns and had filled some root canals under some inlays. His physician had sent him to a radiograpehr, suspecting that there might be some foci of infection in the mouth. Knowing that I was doing this work he came to me. I ray patients day after day and almost invariably find some trouble, and thought I would find trouble in this case, and prepared him for it before I took the pictures. But in no case where the canal had been filled was there any sign of trouble, and the root amputation (a lateral) was in perfection condition. There was no sign of a rarified area at all.

That, of course, is only an individual case, one case out of a great many. I have, however, had the opportunity of checking up on a good many cases in which operations were performed at the time of my internship with Dr. Brophy, and I have no hesitation in saying that when the case was properly selected the result was satisfactory.

I have operated on many cases under protest; I have operated on some cases where I told the patient it was the last hope, and they need not expect much from the operation. But after preparing the patient in that way, I did not feel at all guilty if the case was a failure. I would insist that if these cases are properly selected, as Dr. Buckley has said, and if the operation is properly carried out the result will be successful, and my radiographic findings are invariably to that effect.

Dr. C. M. Meade, Carmi:

I have read and heard a number of papers on root canal work in the last 22 years and to my mind Dr. Gilmer's paper is one of the most practical contributions I have ever noted on root canals of pulpless teeth.

Huxley teaches us that "Science is common sense systematized," and it appeals to me that Dr. Gilmer has presented a scientific paper and that it is based on common sense systematized.

Our guest, Dr. Perry, said, "Dr. Gilmer and others don't know what to do with pulpless teeth and I don't know and I'd like to know who does know?"

With all due respect to our guest, I will ask him a question: With all the failures we have all had, with the many failures the most scientific and expert men have had, are we going to say that men like Drs. Buckley, Logan, Callahan, Grieves, Rhein and Ottolengui don't know? If not, what are you going to do?

A number of years ago, about the time that I entered the practice of dentistry, the medical profession took the pendulum and swung it as far as they could on systemic poisoning from amalgam fillings. Where are they today? I was in the office of Dr. Rhein about a year ago, and I am happy to say I was in the clinic with Dr. Grieves of the Johns Hopkins Hospital. I was in the office with Dr. John R. Callahan for a few days trying to learn what little I could from these distinguished men and their work. Dr. Kelly, one of the founders of the Johns Hopkins Hospital and a man of international reputation as a surgeon, and Dr. Bloodgood, the great cancer surgeon, who recently read a paper before the Chicago Dental Society, and Dr. Burnam, the wizard of radium, working in Baltimore in the Johns Hopkins Hospital, said to me that the medical profession made the greatest mistake of their lives in condemning the dental profession as they did in the past; and in many instances are doing today, and that the medical profession were absolutely wrong in some of their statements. They told me Dr. Grieves had proven to them beyond question of doubt that in many instances they were absolutely wrong, and I am thankful we have such men in our professions.

Dr. E. J. Perry, Washington, Iowa:

I came to this meeting because I saw by the Bulletin which your Secretary very kindly sent to me that Dr. Gilmer was going to read this paper, and I did not know but what he would answer the question. Another thing: I wanted to see my old friends, and a still further reason is, I am not far from here, anyhow.

Now, I will refer my friend who has just taken his seat to a paper read before the St. Louis Dental Society by one of the most distinguished research men in this country, Dr. Price, who, in all humility, confesses that he is absolutely, totally and entirely incapable of filling the roots of teeth. I do not feel very much ashamed to put myself in the same class. I know that I have filled the roots of pulpless teeth where there was not a pathologic condition preceding it that we call septic roots, and very many times when they were septic, thanks to Dr. Buckley for formo-cresol, and many of them are comfortable, so far as I know. From what I have previously said, I did not mean to convey the idea that I intended to stop. I expect to fill pulpless teeth as long as I practice dentistry, and I am not quite sure but what I shall take up the amputation of all the root ends of teeth when I am sure that they are threatened by absorption, if I can find a radiographer that can convince me of it. I have in my pocket a radiograph of a tooth root which was crowned with gold about twelve or fourteen years ago that never gave any trouble at all, so far as the patient knew, and we had a difficult time in finding out where the trouble was in the vicinity of this tooth until I had a radiograph made of it. As it showed a darkened area, I thought I would extract this root anyhow. The radiograph does not show that this root end is threatened by absorption at all, and

I did not find it out, so I extracted the root. I am not quite sure if I had resorted to root end amputation under perfectly aseptic conditions, as laid down by Dr. Buckley, I might possibly have succeeded in saving this tooth. It was for a patient for whom I would have given a good deal to have given him that service.

Dr. George W. Haskins, Chicago:

There have been many thoughts going through my head this afternoon which prompt me to say a few words. It seems generally accepted as a fact that infection about the apices of the teeth is the cause of general bodily ailments, and far be it from me to say it is not so, but somehow or other I cannot believe that it is the cause of so much trouble as we have been led to believe, and I would not be surprised if in two or may be twenty years from now this whole theory should be swept aside and something else take its place, or it will be relegated to a less major position than it now holds. Those of you who know me best know that I am not saying this from sensational motives, nor am I opposed to the theory of focal infection. Most sincerely do I say it for the reason I think we ought to watch our steps. The medical profession generally and too many of the dental profession are going too hard and too fast in the sacrificing of—I will not say good teeth, but teeth that so far as they are useful to the patient to eat with, are perfectly good. I may be entirely wrong; I may be partially wrong. But let me caution you to go slow in this matter until we know more than we do now, because the evidence which has led us to these conclusions is circumstantial, and circumstantial evidence is not to be depended on, valuable though it is.

Dr. Gilmer (closing):

I wish to thank those of you who have taken part in the discussion of my paper. The reason I felt that what I might present would not be satisfactory was because, as Dr. Perry has said, I did not answer the question with sufficient definiteness.

Dr. Noyes asks what will happen to the dead dentine exposed by resection of roots. This question exposes the weak part of this method of treatment of chronic alveolar abscess. As yet, we have insufficient data. If we may depend wholly upon the showing of radiographs, then we must conclude that bone is filled in in a large number of cases, seemingly completely covering the cut end of the root. If we reason by analogy, using the replanted tooth as a basis of comparison, then we must conclude that the dentine will be cut away, as we know that the roots of all replanted teeth are cut away sooner or later by the osteoclasts. If the cut dentine is sealed in by nature, as seems to be the case in some instances, then there is every reason to be hopeful of the results to be obtained by resection.

Dr. Noyes may remember a case we once saw together where a radiograph made a year or two following resection of the apex of an abscessed tooth showed a rarified area. In this case we thought that the abscess had not been cured. I opened into the supposed abscess and found, instead of a bone cavity, a dense white connective tissue, filling entirely the old curretted cavity. Since there was no indication of infection, the condition was left undisturbed. The absence of lime salts in the area permitted the free passage of the rays, therefore the rarified appearance.

Dr. Bentley misunderstood me. I did not say that if a tooth's root was denuded of a part of its peridental membrane it should be extracted. The thought I meant to convey was that that part of a root denuded of its peridental membrance was a foreign body, therefore a menace to the health of the patient. Whether such a tooth should be extracted or the dead part of the root resected, would depend upon the extent of the area uncovered. Dr. Bentley wishes me to indicate what means other than the radiograph may be employed to determine whether an abscessed condition exists about the roots of teeth. I employ three means of determining the condition—the radiograph, the appearance of the overlying soft tissues, and the sharp steel probe. The radiograph is not in all cases infallible, but may very generally be relied upon. Usually if an abscess exists there will be found a trifle more redness of the gums overlying the apex of the infected root than exists over the corresponding tooth on the opposite side of the jaw, providing it is a healthy root.

I have found the sharp steel probe valuable as an aid in determining the extent of a chronic abscess. Even if the bone overlying an abscess has not been destroyed, the sharp steel probe may with slight effort be made to penetrate it. If an abscess exists, the probe drops into it, when its outline and extent may be determined. One is not infrequently surprised, on removing the cortical portion of the alveolar process, when no sinus in the dead bone exists, to find a large abscess cavity much more extensive than the radiograph indicated, the rays having penetrated only the thinnest parts of bone.

Dr. Bentley brought up the question relative to my statement that I was of the opinion that the bacteria causing alveolar abscess reach the root through the blood stream rather than through the root canal. Teeth become abscessed so frequently when no cavities exist in the teeth that we must know that in such cases the infection must be hematogenous. In my study of the bacteriology of alveolar abscess I found the organism to be a streptococcus. The streptococcus of the mouth is usually a saprophite. Through transmutation this form of streptococcus may, after invading the tissue, become pathogenic, when it would be able to cause pus formation, but I am doubtful if it could pass through the root canals and perform this office until it had had a considerable existence as a parasite.

DISCUSSION OF DR. O'HARA'S PAPER.

F. F. Molt, Chicago:

We have thoroughly enjoyed Dr. O'Hara's paper, both because of its valuable subject matter, and of the original way in which it has been presented. Dr. O'Hara lives up to the expectations engendered by his name, and we are glad, in a way, that he was checkmated, although without doubt his extemporaneous discourse would have been as enjoyable as his paper.

There is nothing to "cuss" in the paper—it all "makes sense." As he says, there is a division, but not into two classes. I think besides the ultra-conservatives and the ultra-radicals, there is that large middle class that maintains its equilibrium while still being radical enough to recognize conditions as they exist.

We must acknowledge, however, that besides needing instruction in the reading of radiograms, there is still a vast field for investigation in the realm of the pathology of alveolar abscess conditions. Everyone, of course, may consider himself an "authority," but we are accustomed to consider those who teach such subjects as the real authorities, and heaven help the pooor dentist who attempts to reconcile ALL the teachings on this subject.

I quite agree with the Doctor in the matter of checking up on X-ray findings by exposures from varying angles, for it really is surprising what different interpretations can be made from these different pictures of the same area.

Of course we are always taken to task for our "bum guesses," but a great many errors may be avoided by combining radiographic with clinical findings, and holding judgment until this can be done; therefore, next to actual consultation with the radiographer, telephonic consultation is to be desired; and least of all, the cut and dried "absolute" diagnosis which does not consider at all the history or clinical conditions of the case.

Just what may we expect in the way of rebuilding of bony structure? The last word has not been said, we are confident. It is reasonable to suppose, however, that if bone will build into a socket from which a tooth has been extracted and into an erstwhile abscessed area curetted in a root resection, as it undoubtedly does, it will, under favorable conditions, rebuild where a cured abscess has existed. I mean really cured, for just mere subsidence of the acute symptoms does not necessarily constitute a cure. I have observed in my own mouth the structural changes following the curetment only of an abscess where, although root amputation was indicated, I hesitated to undergo it.

Dr. Arthur Black recently gave us an awful jolt when he told us that these rebuilt conditions do not "stay put." Time and more extensive investigation will prove or disprove the truth of this statement. To be sure, ALL rarified areas are not true abscesses, but who can tell which are and which are not in all cases? They are all open to suspicion.

I am accustomed to counter the question, "Shall I retain this tooth and make an effort to save it?" with another, "What is your patient's physical condition?" There can be no doubt in the light of present knowledge that oral septic foci do cause untold harm, and since we cannot have direct access to the rarified areas and are unable to culture each individual case, how, then, are we going to know which are the dangerous ones?

There is no denying that the advent of dental radiography has made the practice of dentistry much more complex and has had a most distressing effect on the practices of some of the careless and slothful operators who for many years "got by." There is still much to be attained, nevertheless, and, given standardization of technique, added familiarity with negative readings, and elimination to as great a degree as possible of the extremes of radicalism and conservatism, the Roentgen ray will assume even greater value than it now has and will be in universal demand.

I have my order in for one of Dr. O'Hara's phonographic attachments!

Dr. A. B. Patterson, Joliet:

I am very sorry I was unable to hear but the latter part of this excellent paper. I have nothing in particular to add except to say that the work I have been doing with the X-ray shows it is work that any member of the society can do if he will devote time and study to it. It seems difficult at first, but as you progress you find it is not nearly as difficult as you thought.

Dr. O'Hara (closing):

I am really disappointed in not having a big difference of opinion to thresh out with the congregation. My discourse was a generalization of radiography in connection with the teeth. This, I thought, would appeal to the majority. I have another discourse upon the pathological question that is on tap when needed.

Dr. Patterson remarked that X-ray machines have become so simplified that anybody can use them. Too true. Everybody's business is nobody's business. Dental radiography is an entity—a separate and distinct entity from that of dentistry in general. It requires a man highly trained along special lines. The general dentist will do well to keep his hands off the X-ray machine and to have his work done by the man who has specialized along X-ray lines and has given up general dental work. The "master-specialist" in dentistry, as well as in medicine, is a very suspicious person; not one of us can master the entire field. Those of you who are specializing on dentistry had better have your films of teeth made by the fellow who has perfected himself along that line. Not only will you have better work, but you will enjoy better interpretation, for the experience of reading thousands of dental films is superior to that experienced in dozens or even hundreds.

Again, gentlemen, everybody's business is nobody's business, and it is regrettable that X-ray machines have become simplified. Some one will suffer sooner or later. I thank you.

CHICAGO ODONTOLOGICAL SOCIETY.

A regular meeting was held April 3, 1917, with the President, Dr. F. E. Roach, in the chair.

Dr. A. M. Moody addressed the society on the subject of "The

Relation of Mouth Infections to Systemic Diseases, with Special Reference to the Anaerobes."

Dr. Moody said that the most important work on bacteriology of mouth infections was done by Miller. The speaker said that he had been especially interested in chronic infections of the teeth. The material for certain experimental studies made by him had been obtained from private patients of Dr. Gilmer. The pus was drawn off from chronic walled-off abscesses at the roots of the teeth, and received in sterile sealed glass capillary pipets. In fifty-five chronic alveolar abscesses, material was obtained from three groups of cases, one being patients with chronic alveolar abscesses and articular rheumatism, the second group, patients with chronic alveolar abscesses and some other form of disease than articular rheumatism, and the third group, which was used as a control series was from individuals with chronic alveolar abscesses but no other signs of illness. The subjects were well past middle life, with no history of previous illness.

As to the method of examination: the material was diluted in bouillon and divided into four parts and cultured aerobically on blood agar plates; secondly, in ascites-dextrose broth; third, anerboic cultures on blood agar slants, and shake cultures in tall columns of ascites dextrose agar. Growth occurred in almost every instance. After twenty-four hours' incubation, animal injections were made, and in forty-eight hours enough material was obtained to inoculate two more animals. The organisms from each patient were injected into 4 animals which were killed usually on the fifth day, and in no event later than the tenth. The results of autopsy were classified.

In group A, the material was collected from 15 patients and 50 animals were injected. Lesions were found in the stomach in 35.7 per cent; in the endocardium 16.7 per cent; in the joints in 35.4 per cent, in the muscles in 46.3 per cent; and in the jaws in 13 per cent.

In group B, the material was from 15 patients, 57 animals were injected; 50 per cent showed hemorrhage of the stomach, 22 per cent lesions in the joints, 22 per cent in the endocardium, 30.5 in the muscles, and 16.7 in the jaws.

In group C, the control series, the material was gathered from 19 patients, 71 animals injected; 37 per cent had stomach hemorrhage; 21 per cent had lesions in the joints, 22 in the endocardium, 35 in the muscles, and 20 per cent in the jaws.

Of the total series the average per cent of stomach involvement was 41; in the joints 26, in the endocardium 20, in the muscles 37, and in the jaws 16.

This means that there is present in the teeth and in chronic alveolar abscesses a streptococcus viridans, which when injected into animals produces lesions in these locations in a certain percentage of cases, regardless of what the patients from whom this organism was isolated may have been suffering from.

The real object of the experiments was to determine if there was any special affinity that these organisms have for joint muscles and nerves, or the jaws. The hemorrhages in the jaws occurred below the central incisor teeth. The bacteria can be isolated from these regions of hemorrhage.

The bacteriology of this series of abscesses has not been published. The streptococcus viridans is present always in practically pure culture when the organism is grown aerobically, when collected without outside contamination. In anerobic cultures the streptococcus was present in 29.9 per cent; small bacilli producing on blood agar a black pigment, 23.4 per cent; diptheroids in 11.7 per cent; long thread-like organisms present in 10.4 per cent; fusiform bacilli in 10.4 per cent, organisms resembling the micrococcus catarrhalis in 3.9 per cent, and branching gram positive bacilli 2.6 per cent.

The anaerobes are present where dead and putrifying tissue is found. In pyorrheal pockets about teeth, and in the tonsils we may find a mixture consisting of the fusiform bacilli and the bacillus nulliformis, and the streptococcus. When in pure cultures these organisms injected into animals produced no lesions. When mixed they will produce lesions, probably due to the streptococcus because of its more rapid growth. A great variety of lesions is produced. In ulcerative gingivitis and Vincent's angina, these organisms are found in practically pure culture. (Various microphotographs illustrating these various bacteriologic findings were passed around for inspection.)

These organisms are also found in anaerobic cultures of putrescent pulp, which is good soil for bacterial multiplication. The organisms may be isolated and cultured. They are also found in gangrenous conditions about the mouth. They are occasionally found in brain abscesses, in abscesses in the lungs and in empyemas.

They occur in the form of a grayish pus, watery, composed almost entirely of these bacteria. Aerobically there is no growth. Anaerobically the growth is luxuriant. This also occurs in abscesses along the gastrointestinal tract, and also sometimes in periurethral abscesses.

One of the most common of the mixed organisms are the diphtheroids which are nonpathogenic for animals. They are found in various parts of the body, and in chronically infected teeth, in lymph glands, in the urinary tract and in the skin. They are of doubtful pathogenicity in man.

Another organism is the bacillus annulliformous, which produces a foul odor, and a black pigment or culture media. This breaks down the tissue which has already been partially destroyed by the other pyogenic organisms. It is found in the sputum, in chronic bronchitis, in certain types of long standing bronchial asthma. It is pathologic when in symbriosis with the fusiform and the streptococcus.

In pyorrheal pockets all sorts of organisms are found, the fusiform, members of the colon group, animal parasites, amebae which are saprophytic, but only incidentally.

DISCUSSION.

Dr. C. W. Wells:

The question of focal infections is a very great and important one. There is abundant clinical evidence of the relation of focal infections to systemic disorders. These problems are now being studied from the laboratory point of view. In 1683 a Dutchman observed five different organisms in scrapings from teeth, but he could not designate or describe them in detail, so that bacteria in and about teeth are not of recent determination.

It has been thought to attach importance especially to the anaerobic organism in connection with infection about teeth. Some the fusiform bacilli and the spirillae to be among these but of little importance. Even after the lowering of local tissue resistance, investigators have shown that as infection increases, there is an invasion of various other organisms. Other investigation has shown pathological lesions have not been produced following innoculation with the fusiform bacilli.

I would like to ask Dr. Moody if any differences in results were obtained following the inoculation with the anaerobic and aerobic streptococci?

Dr. Moody:

We have injected with the combined growth, cultures were made from them and nothing but the streptococcus viridans was found in them. In the next culture made from a 24-hour growth, there were scarcely any other organisms than the viridans.

Dr. Wells:

Is the streptococcus the root of the trouble? The fact that we often fail to produce lesions following animal inoculation with various streptococcus would seem, on the surface, to divest them of great pathogenicity—in many instances—often we can obtain from pathological lesions in man organisms such as the streptococcus. Whether the teeth are the source of such an infection is a question yet undecided.

Before attaching too much significance to the importance of any organism as a definite causation of pyorrhea or alveolar abscess, we must satisfy Koch's fundamental principles. We must isolate the organism from the lesion, reproduce the lesion with the organism and reobtain the organism from that lesion. That has never been done in connection with pyorrhea and alveolar abscesses as far as I know. It is almost impossible. Until that is done we must agree with Miller's conclusion that alveolar abscesses are due to a combination of at least three influences, constitutional disturbances, local irritation, and the bacterial invasion.

While the clinician may be able and justified in drawing certain deductions bearing on the relation of focal infections to more remote general disturbances, yet the final answer to this problem must come through such work as that presented by Dr. Moody, a result of co-operation between the clinician and the laboratory worker.

Dr. J. G. Reid:

The best bacteriology has not yet been obtained, but we are progressing, and approaching the best and most ideal things in that field. The subject is vast, and time will be required to solve its problems. Much difference of opinion exists, which is however necessary for progress. We become proficient by close attention to one particular line of work.

Dr. J. E. Hinkins:

Some fifteen or twenty years ago I made a hundred tests for acid salivas in the mouths of different people. Dr. J. Herter of New York claimed that an acid condition of the saliva was due to the anaerobes. Dr. Herter defined the anaerobes as a class of bacteria which obtain their oxygen indirectly by enzymatic processes, and fermentative proteolytic cleavage, by carbohydrates and proteids for the reduction of reducible bodies. We find that if we can hold the saliva for a certain length of time its acidity will not be increased. The secretion from Steno's duct was an acid as this saliva. Dr. Herter afterwards decided that the anaerobes had nothing to do with the acidity of the mouth and ducts.

Dr. H. H. Schuhmann:

It is certainly delightful to listen to a paper based on such exact methods of technique. The great difficulty in drawing correct conclusions and opinions from the tabulated results of the work of many pathologists is due to the fact that they employ such diversified methods in technique that it would appear a mistake to accept the individual findings all on the same basis of parity without making allowances for difference in methods used to obtain the results. It has been a great pleasure to me to listen to such a paper as we have had this evening. The results Dr. Moody has obtained in his work are based on a laboratory technique to which none can take exception and I only wish his methods were more universally used. His methods are practically the same as those used by the Chicago Dental Research Club and it certainly is of advantage to be able to accept his findings in such a way that we can add them directly to our findings without the need of making allowances for difference in methods which always leads to more or less error.

As to the transfer of specimens to the laboratory and there producing artificial cultures for experimental work: It is very unfortunate that usually the amount of material obtainable from blind abscesses is so small as to preclude the possibility of direct injections of the material into animals, but when cases present themselves where such a procedure is at all possible it should be done so as to arrive at conclusions which are absolutely devoid of possibility of error and results tabulated of such cases would be of inestimable value. Innumerable errors are apt to creep in the methods we usually are obliged to employ in transferring these cultures numerous times from one media to another and then grow them artificially with all sorts of temperature changes and in unnatural surroundings the morphology and pathogenicity of the organisms is many times so entirely altered that you can hardly recognize them as the same germs, and findings based on such methods as not entirely satisfactory, although as a rule they are the best we can get, but when we are able to furnish pathologists occasionally with blind abscess of a sufficiently large size and in the proper sterile conditions together with complete histories, it would be of very large help if the contents of such abscesses could be used in direct injections into animals and statistics gradually gathered from such results would indeed be of great value. As to oral foci of infection there is no doubt that they are injurious and do cause pathogenic changes in the individual carrying such foci of infection but I doubt if they are responsible for any definite and specific disease; I am more inclined to the belief that they lower the resistive power of the individual to such an extent that he becomes more liable to infection or the organisms already present have the opportunity of getting the upper hand and produce the various pathogenic changes which such organisms are likely to show. The statements which Dr. Moody makes with reference to the results obtained by the injections of the various pathogenic cultures from laboratory growths are the same as those claimed by other investigators. These cultures when injected into animals produce various pathologic changes attacking at one time one organ and then again an entirely different one, in other words the direct reproduction of a particular specific diseased condition in a definite and specific organ has not been obtained in his experimental work any more than in the work of any others and he does not make any such claim.

That such injections would produce infectious changes in animals some place is quite a natural consequence but these do not prove in any way that these oral foci of infection are responsible for any particular specific disease, but that they are the direct results obtained from the introduction of pathogenic organisms into the circulatory system. When these foci of infection with relation to pathogenic changes elsewhere in the human system have been corroborated by the standards of Koch's laws, when we shall be entitled to make the claim that they are responsible for certain definite diseases. There are many other reasons why I cannot accept at the present time the statement that these foci of infection are responsible for specific diseases, one other being the low degree of virulency of the organisms contained in these blind abscesses being bathed as they are for years in their own waste products and cut off from proper supply of nutritive material they could hardly be expected to be of a very virulent character and growing as they do practically anaerobicaly according to modern ideas of immunity, should only be capable of producing but slight pathogenic infections elsewhere. Still another reason for my objection to the statement that oral foci of infection are directly responsible for this and that particular diseased condition is that lack of definite results from the therapeutic use of autogenous vaccines. I do not wish to be misunderstood and therefore repeat that I do believe oral foci to be absolutely injurious and capable of producing pathogenic disturbances, and therefore believe thoroughly in their prompt and thorough removal.

We still have a great deal to learn on this subject and I hope that pathologists interested in these matters will continue doing the excellent work they are doing and by giving us the benefit of their experiences we shall be able to gradually obtain more light on these subjects.

Dr. L. L. Davis:

In giving a tabulation of the results of the injections of the various organism into animals and the findings in various parts of the body, Dr. Moody spoke of certain results in the jaws. I was wondering what was the result, and at what place in the jaws? Later Dr. Moody spoke of hemorrhage in the periosteum only.

Dr. Moody:

Occasionally into the peridental membrane in scurvy animals. The peridental membrane was not examined in this particular series of cases.

Dr. Davis:

Is it not possible that the post-mortems were not made thoroughly enough, and might we not obtain some results from the peridental membrane which would partially fulfill Koch's laws, in getting a peridental or pericemental inflammation as the result of the streptococcus viridans, from a pus pocket at the apex of a root?

Dr. Moody:

All the teeth were examined to see whether they had been loosened, but nothing else. Many of the teeth were examined histologically in scurvy cases, and there too hemorrhages were found in the peridental membrane and also in the pulp chambers. This was in the original animal which had scurvy. It was simply a symptom of the disease. In a low percentage of those which were injected, where we examined the lower central incisor teeth, we found small hemorrhages and the bacteria. When the bacteria are injected into the heart or the blood stream, some of them will go into the jaw and the small capillaries there, and will produce hemorrhages and bacterial emboli. Not much occlusion is required in the fine capillaries of the teeth to produce hemorrhage. I do not think that would indicate specificity of the organism for that location.

Dr. Schuhmann:

You did not find the hemorrhages in animals where the bacteria were introduced from blind abscesses?

Dr. Moody:

No. In cases of scurvy. In this series none of the teeth showed lesions enough to warrant the making of sections of the teeth.

Dr. Sidney J. Knowles:

It is evident this is a very complex subject. In a blind abscess, where often the streptococcus viridans is isolated and is shown to be the predominating organism, why will a blind abscess remain as such for many years and never grow to completion, while in another instance we have focal infection, starting in the same way and going through two completions, in the nature of an acute alveolar abscess with later a discharging sinus?

Dr. Schuhmann said the streptococcus viridans about the end of a root has lost a degree of its virulence. I cannot agree with him because I have in mind several instances where from clinical and X-ray pictures and from reasoning from the situation, it has seemed wise to extract, because the patient has suffered from a definite articular trouble, with no other cause discoverable by able men. Within a week after the removal of the tooth, the rheumatism disappeared, with no recurrence. That is not a scientific answer of course, but it is evident that that is some factor.

Blind abscesses are often factors in secondary reactions. With exactly the same infection in 10 different people, they do not all react the same. The injection of the same organism into similar animals under similar conditions has very different effects, thus indicating varying bodily resistance. The reduction of resistance may give rise to the flaring up of a condition which had been quiescent for a long time.

The fact that a patient is suffering from a severe secondary reaction alters the case from that of a person who has no such reaction. The findings of X-ray pictures are not always absolute indices of the existing condition, as for instance a prominent granuloma, which the X-ray picture did not at all reveal.

I cite the case of a woman who had a leukocyte count of 14,000, accompanied with loss of weight and running down of general conditions. Tuberculosis was suspected. The X-ray showed two teeth without rarifaction, but revealed the presence of cotton-wedged into certain of the canals, which had remained there for two years. Upon removing, cleansing and appropriate treatment the patient recovered quickly, and the leukocyte count dropped to 8,000.

Dr. Moody (closing the discussion):

The reason I selected chronic alveolar abscesses was because of the simplicity of their bacteriology, and because of ideal conditions for experimentation. The abscesses contained one organism which could be grown in pure cultures.

There has been no purpose or intent to show that the streptococcus viridans is the cause of pyorrhea. Therefore, we must differentiate between pyorrhea and these chronic or walled off alveolar abscesses, with a very small amount of material. The injection of so small an amount into a healthy animal would not produce pathological changes. The susceptibility of various apparently similar experimental animals differs greatly. Very many factors enter into the problem. We cannot go so very much farther than we did twenty-five years ago. We will not accomplish much until we get this matter on a chemical basis.

The streptococcus viridans has certain characteristics, as the production of chains and presenting a green appearance on blood cultures; many of them are saprophytic, and never produce disease. On the other hand, many are very virulent, and when injected produce death or severe lesions. Between these two extremes are found all degrees of variation in virulence. It is difficult to separate the different types.

Streptococcus viridans may cause disease in various parts of the body. The lesions produced by organisms from persons without systemic disease are identical in character with those produced by organisms from patients with systemic disease. The fact that the former do not produce lesions quite as frequently as the latter, indicates a difference between the organisms only in degree of virulence.

Whether the lesions produced in rabbits by streptococci from persons who aside from their alveolar abscesses are in perfect health, warrant the conclusion that these persons would develop similar conditions were the foci of infection not removed, is a question which cannot be satisfactorily answered. Many of them at any rate are well past middle age and otherwise in good health.

There is in these experiments abundant evidence for and against the elected affinities on the part of the streptococci. Therefore, one must conclude that the localization of streptococcus viridans cannot be determined wholly by some property inherent with the organism itself.

Dr. Reid:

Were these chronic alveolar abscesses all designated as blind abscesses, and not sinuses?

Dr. Moody:

All blind abscesses.

Dr. Davis:

Are they definitely walled off, so that they form granulations, or are they just the way that the picture shows, as infected bony tissue, surrounding the apex of the tooth?

Dr. Moody:

I cannot answer that.

Dr. Davis:

A slight change in the picture, a shadow in the picture, that is the idea.

Dr. Moody:

Yes. All I have is what Dr. Gilmer has described to me as a blind abscess. I have his word that that is what they are, and we outlined the type of procedure, and he collected all the material. I saw none of the patients and none of the pictures. Dr. Gilner did all of that. That was from his private practice. The material was sent to me as soon as collected in sterile capillary pipets and cultures were made immediately.

Dr. Reid:

In collecting the material at what point was the collection made?

Dr. Moody:

The depth of the socket and the end of the tooth root right from the granuloma cells. These were not all extraction cases. He went through the cancellous bone tissue from the side and not through the root end.

Dr. Schuhmann:

He obtained pure streptococcus viridans the same as we obtain them from an extracted tooth, when we spread the surface of the granuloma and collect with a sterile pipet.

Dr. Reid:

The streptococcus viridans is confined by part of the peridental membrane. A pocket is formed by it.

Dr. H. H. Schuhmann:

Dr. Gilmer contends that the peridental membrane is destroyed and that a cystic wall is formed. These granulomas are attached to the root ends by small pedicles, although at times by a broad base. Many X-ray pictures present definite proof of reorganization in these granulomas as we can see the fresh bone deposits quite plainly.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL

A LOSS THAT IS OVERLOOKED.

A professional man starts out as a student with a very limited knowledge of the intricacies of the particular calling he selects, if indeed he has any knowledge of it at all. Month after month, year after year, as student and practitioner, he adds a little here and a little there to the sum total of what he knows. He learns from books, from association with his fellow-practitioners, and from his own personal observation and experience. After the foundation of his knowledge is laid by reading and consultation, the very greatest advance comes from his own experience. It is this after all which in the final analysis gives him the best and surest basis of judgment. The great surgeon does things every day which he never learned from books, the great diagnostician looks for symptoms which have never been written, and which cannot be written. The life forces are so intricate and varying in their manifestations that they cannot all be tabulated for others to read, but they can be interpreted in a wonderful way by the man who has given a life time to their observation. Much of course can be taught by some and learned by others, but not all. It is only in the crucible of his own career that every man gains the surest insight into the intricacies of the problems that are presented to him daily in his professional life. An observant and studious man learns to *know* symptoms when he sees them. He develops an intuition of things which is altogether impossible to the man of meagre experience. His decisions are sure, and he is better able to recognize and meet emergencies than he was as a beginner. Not that he never makes a mistake—all men do this to the very grave—but that his mistakes grow fewer and fewer as his experience ripens.

In the end he has accumulated a fund of knowledge that is a real asset to his age and generation. In that one man's brain there is a well of information that does not exist in any other single brain. It is knowledge that is available to humanity only so long as this man lives, and here comes the sad reflection. It is an irreparable loss when an experienced professional man dies.

Frequently it has been stated that there is no man in the world whose place cannot be filled. This may be true in commercial life, but it is assuredly not true in professional life. Has the place of G. V. Black been filled in dentistry, or can it ever be filled? Could Black impart to others all he had in himself? He imparted much, but not all, and when he died there was lost to the world something which was a real asset. This seems inevitable in the natural order of things. Men must die even as men are born, and we should be thankful that we have great men if only for a span; and yet the writer of this never hears of the death of a good and great man in dentistry or medicine that he is not forcibly impressed with the serious and tangible loss which the world has sustained. The lesson is that we should cherish more and more the association of our great men when we have them with us, that we should be grateful to them for what they are doing to make human life more livable and that we should profit by their example to do more and more for humanity ourselves.

THE EDITOR'S DESK.

LETTERS TO A RECENT GRADUATE.

LETTER NO. VIII.

My Dear Girl:

There, you thought I had forgotten that there were young lady graduates, but I had not. The only reason I did not address you before is that for the most part the advice I have been giving "my Boy" did not apply to you. Frankly, I do not believe you needed it, and just as frankly I believe he did. This does not mean that you should arrogate to yourself a vain superiority over him, but merely that nature has so willed it that you are less inclined to waywardness and more inclined to observe the proprieties of life than he. It is to the glory of women that we expect more of them than we do of men, and whether this is right or not I imagine that we shall always continue to expect it.

Your selection of dentistry as a profession was prompted by a more sober reflection than that which animated the Boy. You probably thought long and seriously over the matter, and so you come to our ranks with an exalted conception of your responsibilities and a high ethical standard. I have never yet known a woman dentist to become a quack practitioner. It has remained for men to try to drag the profession into the mire.

I welcome you most cordially into the profession, and I conceive it to be one of the opportunities through which women are rapidly coming into their own. There is a place for you—a very important place—in dentistry, and that you will fill that place I have no doubt. But I have a word of caution for you. Do not hibernate. I have known women dentists to hold aloof from the profession after graduation, and content themselves with cultivating a small social circle, and thinking of nothing but their practice and their circle. This is a mistake. Remember that it is just as incumbent on you to keep abreast of the profession as it is for the man to do it. It is the only way in which you can continue to have zest, enthusiasm, and absorption in your work, and unless you can have that your practice will degenerate into mere drudgery. Above all things you need the inspiration which comes from constant advancement. You need the stimulus of new ideas. Please do not forget that. It is the very breath of life of professional practice.

To enjoy this life to its full you must identify yourself with dental societies and attend. You will be a thousand times welcome, and if you do not feel at home at dental meetings it will be your own fault. Do not expect too much in the way of individual attention. It is one of the penalties of your entrance into professional life that men have grown to take it for granted that you are merely an integral part of the professional machinery. It is no longer an "event" for a woman to belong to a dental society. I have said that it was one of the penalties—it is also one of the achievements that this is so, and you should accept it with satisfaction rather than with mortification or disappointment.

Your gravest danger is in becoming too self-centered in your professional relationships, and to become self-centered in any pursuit is to stagnate. Unless you can get happiness out of your work you made a mistake in starting it, and the only way to get happiness in dentistry is in sharing it with others. The only happiness you retain is the happiness you give.

And now to "my Girl" and "my Boy" conjointly I give you my best blessing. I shall watch your career with the keenest interest, and with the highest hopes. You are to me more than a mere practitioner of dentistry—you are my very own. Around you I hang my aspirations for the future development—the future glory—of the profession. On you I pin my faith.

Your path will not all be made of velvet, nor your bed of down. Planks will fly up to trip you, and your garments will gather burrs. The grades will be steep at times and the footing bad, so that you will slip back. Be thankful. In difficulty there is development, and in obstacles there is growth. No one ever attained to much who did not suffer much; it is the law of compensation.

It is fortunate for you that dentistry is an exacting pursuit. It demands of you your very best, else it will do for you its very worst. There is no compromise.

Away down in every one's heart there is the desire to achieve. Without this life would be colorless. You cannot achieve without effort, and you cannot make the effort without incentive. To foster incentive there must be opportunity, and opportunity is hewn from the solid rock of hardship.

Therefore be grateful that the practice of dentistry is hard. In life there is constantly the tendency to seek the shady side of the path, to keep on the windward side of the blast. This is enervating. Better far to brave the blast and take your rightful place in the sun. Be thankful for the discipline of dentistry—it is one of your best assets.

Play the game—play it with true manliness, and true womanliness. Have no fear, and ask no favor. Live out your life to the fullest of your capabilities, and keep your face ever turned toward the glowing east.

If you do this I can promise you a life full of healthful activity and usefulness—which is equal to saying a life of happiness. You will escape the folly of fame and the glittering mirage of glory. Have no regrets—these are evanescent as the "baseless fabric of a dream." You will achieve all that is worth while in life and be a blessing to your age and generation. This for you is my fondest hope.

Farewell. You have my congratulations, my benediction, and my love.

Affectionately yours,
C. N. J.

BOOK REVIEWS.

GENNICE, The Birth of Humanity, By *Dr. L. L. Funk*, Chicago, Ill. Price, 15 cents.

This is a small pamphlet of eleven pages dealing with the birth of humanity, and attributing femininity to the Deity. It gives a fanciful sketch of the evolutional experiences of Gennice, the first woman, and concludes with the following statement: "The female precedes and predominates throughout all nature, whether its presence be due to either evolution or creation. God is female. It is woman's right by priority of birth to have equal rights in all matters pertaining to human welfare."

DENTAL METALLURGY for the use of Dental Students and Practitioners. By *Ewing Paul Brady, D. D. S.*, Professor of Chemistry, Physics, Metallurgy, Materia Medica, Therapeutics and Special Pathology, Washington University Dental School, St. Louis, Mo. Illustrated with 62 Engravings. Pages 330. Price, $2.50. Published by Lea & Febiger, Philadelphia and New York.

We are glad to welcome this splendid little volume into the literature of dentistry. It is seldom that so much reliable knowledge of any subject is packed into a similar number of pages. The book while intended for the most part for students, will be found of the greatest value to the practitioner, who is using metals daily in his work. At the end of each chapter on any given metal there is a resumé of its characteristics, such as: Symbol, valency, atomic weight, melting point, specific heat, boiling point, color, malleability, specific gravity, crystalline form, chief ore, conductivity of heat and electricity, coefficient of expansion, ductility, tenacity.

It is a very well arranged and readable book, and we commend it most heartily. The author probably had some good reason for retaining such nomenclature as "oxide," "cyanide," etc., but it would seem desirable in future editions to conform to the suggestions made by the committee on nomenclature of the Association for the Advancement of Science, which some time ago eliminated the "e"—making it "oxid," "cyanid," etc.

CORRESPONDENCE.

LETTER FROM DR. EDMUND NOYES.

Chicago, July, 1917.

Dr. C. N. Johnson, Editor The Dental Review.

Dear Doctor: Dr. Bremner's letter in the May Dental Review commenting on my communication in the April number on "Ethics and Economics" escaped my attention till recently. His discussion of professionel ethics is so good that at first I decided to make no reply to the first part of his letter, but a little reflection has convinced me that the matter is important enough to merit some further discussion.

To spare the reader's trouble to refer to the May Dental Review I may quote Dr. Bremner's argument.

"Dr. Noyes says 'there is nothing more fundamental in human life than morality; that economics which does not find its foundation, etc., etc., on morality is not sound economics.' It strikes me the doctor is overstating this morality idea. Since when has morality become fundamental? Is there such a thing as a standard morality? Is it alike in all ages, and in all generations? Do all people in all countries subscribe to the same system? Which brand of morality has Dr. Noyes in mind? Is it that of the 400 millions of Christians, most of whom are butchering each other just now, or of the 600 million Buddhists? The next statement that economics is unsound unless founded on morality is a new one altogether. Let us see how it squares with some of the facts in our possession."

And then he cites cannibalism and the institution of slavery, which he says were good economics but bad morals, and his conclusion follows. "The fact is economics is not based on morality, but on 'The will to live,' and anything that furthers this primordial instinct, this inherent urge in all life, becomes sound economics and even good morals."

Beginning with the last statement, normal men and women "will to live" morally and spiritually as well as materially and physically. "Since when has morality become fundamental?" Since man acquired a soul and began to realize that his soul is better than his body and should be the master and ruler of his body, and since he began to observe that the final result of making the soul the servant of the body is the degradation and destruction of both, while to make the body the servant of the soul promotes the health, development and longevity of both. This is true in normal conditions of life, but since the soul is better than the body circumstances sometimes arise in which the body must be sacrificed for the soul, and then the fundamental importance and superiority of morality over economics comes to the front and is conspicuous. If it were not so the world would have been deprived of its long list of martyrs, heroes, philanthropists, and all the thousands who have sacrificed themselves for the benefit of their families, their friends, their country or humanity.

"Is there such a thing as a standard morality?" The laws of morality are as sure as the laws of physiology and hygiene, and neither moral laws nor physiological laws are changed for the accommodation of those who are ignorant of them, or misrepresent them, or are indifferent to them, or wilfully disobey them. It has taken men a very long time to discover and formulate the laws of either morality or physics so as to meet with general acceptance, and it should never be forgotten that men do not *make* the laws of either morals or physics, but only seek to discover and obey them. The standard of morality acknowledged by the larger number of people in the Christian world is the Golden Rule. "Thou shalt love thy neighbor as thyself," and this law is not invalidated by the fact that it is not well obeyed, any more than the laws of health are invalidated by the fact that few or none obey them perfectly.

Perhaps this is not exactly an answer to Dr. Bremner's argument, which is illogical when he affirms that cannibalism and slavery are (or were) good economics but bad morals, and then immediately says that anything that furthers "the will to live" "becomes sound economics and even good morals." Perhaps he means that cannibalism and slavery are not moral according to present standards but were good morals at the periods when those institutions originated and flourished. It must be admitted that pragmatic morality, as accepted and practiced by men has often been influenced by economic considerations and has departed widely from true or ideal morality. This is true now and always has been.

I am much less concerned to answer Dr. Bremner's argument than I am to make a plea that economics, and all other purely material and physical motives and forces should be subordinate and willingly obedient to moral and spiritual powers, and that men should seek to comprehend moral and spiritual ideals and laws and obey those laws and embody those ideals in life and conduct.

Edmund Noyes.

DR. NOEL'S METHOD OF FILLING ROOT CANALS.

Nashville, Tenn., June 27, 1917.

To the Editor of the Dental Review.

Dear Dr. Johnson: Since promising in the June number to give your readers my method of root canal filling, I have had some letters manifesting an interest, and if you have space for a brief statement, my plan is as follows:

First, I wish to make a few remarks about the preparation of teeth for root canal filling. Obviously, the operation should not be undertaken until the canals have been thoroughly cleared of all pulp tissue, and in order to accomplish this a radiograph will in most cases be of much assistance to the operator, showing when properly taken, the form of the roots and the number of canals. In cases of multiple roots, more than one picture is sometimes necessary, and these must be taken from from different angles. In cases where the pulp has died in the tooth and decomposesd in the canal, the operation should not be attempted until the operator has satisfied himself that the entire tooth is in a thoroughly aseptic condition; but it is not my intention to speak of this here; it was my purpose only to describe a method of root canal filling. However, the preparation of certain difficult canals must be discussed.

In the majority of normal canals, I think the dentist has done his full duty when he has cleaned out all the tissues of the pulp to the apical foramen. There may be some canals in small curved roots, especially in the case of patients of advanced years, that may require the application of sulphuric acid and some careful instrumentation to accomplish this; but here we must use the utmost care both in the selection and use of the instruments lest we fail to follow the curvature of the canal, produce a puncture, or pass the instrument in to the soft tissues beyond the apical foramen.

The foramen may be regarded as the channel through the cementum, giving passage for the blood vessels and nerves to the pulp canals. There may be more than one of these channels through the cementum—they are delta like in some cases, and no attempt should be made to ream through them. In roots having short and abrupt curves at their ends, an attempt at reaming would almost certainly result in a puncture, and in cases where the foramina are multiple, or delta like, only one should be followed; therefore I do not hesitate to lay down the rule—*Leave the cemental portion of the canal undisturbed.*

You will immediately raise the question as to how I am going to take care of the organic matter in this portion of the canal. In answer to this, I will say the antiseptic in my root canal filling will in all cases of freshly devitalized pulps certainly take care of it by mummification, if you please, and in case of teeth where the pulp has died and became putrescent, these foramina will be found open, and pervious to such antiseptics as must be used for cleansing such canals prior to root filling. These latter will be *filled* by my method.

As to the enlargement of very minute and curved canals, the operator must use the greatest precaution. No stiff reamers having a forward cut should be used lest they fail to follow the curves; but after treatment with sulphuric acid or phenol-sulphonic acid, the Donalson broaches, very fine and flexible, are to be used, or the Kerr's files, also very fine and flexible, may be employed, working them up and down in the canal, repeating the application of acid until the operator has satisfied himself that he has reached the cemental tissue at the apex of the root. When sure of this, the acid should be neutralized by the application of bicarbonate of soda. We could say much more of root canal preparation, for it is a big subject; but the above brief reference must suffice.

Supposing that you have a case properly prepared and sterilized, ready for root canal filling. It seems almost unnecessary to say that in all work upon pulpless teeth, the first procedure should be a thorough sterilization of the teeth and gums with iodine before adjusting the rubber dam. No dressings should be removed until the rubber dam is in position and so ligated as to thoroughly exclude the saliva from the canals to be operated upon.

The saliva should never be permitted to enter canals after they having once been sterilized. The following articles should be provided and ready at hand for the operation.

First, a solution of Aristol in Chloroform, thus: Rx Aristol, 30 grains.

Chloroform, 1 fluid ounce—M.

Second, English broaches, assorted sizes, temper drawn to blue color in alcohol flame.

Third, a sheet of pink base plate gutta percha, clean and sterile.

Fourth, a spatula, a wax spatula will do (sterile).

Fifth, a solution, one to one thousand, Mercuric Chlorid for sterilizing the hands, especially the left thumb and index finger.

Sixth, sterile absorbent cotton.

Seventh, assorted gutta percha canal points (sterile).

Eighth, the usual canal plungers and pliers for inserting canal points.

Ninth, a stick of cocoa butter.

Tenth, eucalyptol in short service bottle.

We first select a gutta percha point that will about fill the canal, as nearly as we can judge by trial and measurement. If the canal is large with open foramen as evidenced by the difficulty of obtaining dryness, the weeping of serum, etc., we would clip off the fine end of the point slightly to preclude the possibility of passing it through into the soft tissue of the apical space. Laying this selected point aside upon a sterile paper or napkin, we proceed to introduce the eucalyptol into the canal. This may be done by winding a very minute bit of cotton upon one of the smooth English broaches between the thumb and index finger—previously sterized with bichlorid solution. Dipping this broach into the eucalyptol, it is carried into the canal to apex, this being repeated until we are sure that the canal is filled with eucalyptol to the exclusion of air.

We next proceed to prepare the gutta percha solution by pouring the aristol solution above described upon the sheet of pink base plate gutta percha, and spatulating to the consistency of maple syrup. This aristol gutta percha solution is now introduced into the canal upon a smooth broach that will easily pass to the apex. The broach may be dipped into the solution, which will stick to it; it is carried to the point of the root, dipped again, and the operation repeated until we are satisfied that the canal is filled with aristol gutta percha solution to the exclusion of air. The eucalyptol being a solvent for gutta percha, will lead it to the finest, most hair-like portions of the canal, capillary attraction compelling it to go whereever there is eucalyptol. The canal point is now taken up in the pliers and pushed to the apex; it is next tamped thoroughly with canal pluggers. These should be touched to sterile cocoa butter, and the excess wiped off on sterile blotting paper. The cocoa butter is to prevent the plugger from sticking to the gutta percha, and pulling it out when the plugger is withdrawn.

After the first tamping, the instrument is to be slightly heated in the alcohol flame, carefully wiping the excess away, the tamping is continued with the hot points until the chloroform is evaporated, and the filling is solid gutta percha. A cold instrument may, sometimes in large canals, be worked alongside the hot one to prevent pulling out the gutta percha.

If necessary after filling the apical portion of the canal, other bits from the blunt ends of gutta percha canal points may be tamped in as above described, until the canal is full as desired. In very open canals as where a chronic abscess has existed, a portion of the aristol chloro-percha may go through, but this will cause no trouble.

Pulp chambers, as in molar teeth, should be filled with zinc oxy-chlorid when not needed for anchorage.

In hot weather, the aristol-chloroform gutta percha solution dries up very quickly; to prevent this, a few drops of eucalyptol may be poured upon the sheet of base plate gutto percha and spatulated into the mix.

The above method is not original with your correspondent; I have only added a few details to the method. I do not know where I got it, but I have been practicing it for about thirty-five years. From time to time I have tried other methods in my practice, hoping to find something superior to this in working qualities. I have had almost uniform success with the above method; my only reason for trying other methods being the hope of finding something better and easier to work. I have always gone back to my old method after these trials with increased confidence and satisfaction, and I feel that I can recommend it to the readers of the DENTAL REVIEW.

Sincerely yours,

L. G. NOEL.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Reserve Your Judgment:—There is always a reason, and usually an explanation for everything. Remember this when examining the other fellow's work and reserve your criticism and judgment until you have had experience with the patient.—*J. Frank Nelson, Chicago, Ill.*

A Word to Users of Amalgam:—In mixing alloy with mercury for amalgam fillings it is better that there should be no excess of mercury to squeeze out. If your mix is too soft, better add more alloy until you bring it to the proper consistency without any squeezing out of mercury.—*H. A. Cross, Chicago, Ill.*

To Secure Dense Surface on Gold Inlays:—As e. g. the incisal edges or occlusal surfaces, cut away such surfaces in the wax, or bur away a groove of the finished pure gold casting. and in such groove flow 20k or 18k gold solder, protecting other surfaces with an anti-flux.—*J. F. F. Waltz, Decatur, Ill.*

Root Canals:—Persistent, conscientious cleansing and medication of root canals through properly enlarged access or approaches is more than half the secret of success in the final result of useful roots. Hurried, improper first work leads certainly to conditions which perfect root filling cannot render successful.—*Grafton Munroe, Springfield, Ill.*

To Clean Cast Gold and Taggart Inlays:—In a small rubber cup, hard rubber, I have a solution of hydrofluoric acid, about two-thirds water, in which I place my Taggart inlays for many hours, always over night. Of course they should be cleaned by heated sulphuric acid, two-thirds water, first. You have no fumes nor splash and get brighter gold.—*Homer Almon.*

Pulp Capping Agent:—When in doubt whether to devitalize or not, place some pustolene over pulp-seal with temporary filling and dismiss patient for a few days. If tooth gives no trouble, fill with permanent filling, leaving pustolene, of course, in place. I have found this to be one of the best pulp savers I ever used.—*J. W. Landrum, Heavener, Okla.*

Inlay Gold:—I use coin gold exclusively. Two and a half dollar gold pieces in all my Taggart inlays. It is standard and can be depended on to have the alloy a constant and well mixed blend, and the copper in coin gold makes it an ideal gold to resist mastication, as well as to hold a high burnish indefinitely. It is easy to cut in pieces, if you use the "two and a half pieces." They are very thin.—*Homer Almon.*

Taking a Bite for Crown or Bridge Work:—One of the most difficult items in operative destistry to contend with is the taking of a satisfactory bite, where the occlussion is extremely close. The following is submitted for its possible assistance to the operator in such cases. When the wax or compound bite is removed it often breaks in two pieces, making it difficult to get a perfect cast for the occluding surface or surfaces to be articulated to the crown or bridge to be constructed; or breaks when placed on the plaster model. A good, strong, sharp bite can be obtained in the following manner: Take a piece of linen which comes on each side of a sheet of vulcanite rubber, cut it about length and width of bite to be taken, place bite wax above and below the piece of linen, and take bite in usual manner. The linen holds the bite together and prevents patient from biting clear through. Do not use paper, as paper becomes wet and tears.—*H. F. Schlieffarth, Chicago, Ill.*

MEMORANDA.

NORTHEASTERN DENTAL ASSOCIATION.

The twenty-third annual meeting of the Northeastern Dental Association will be held at the Bancroft Hotel, Worcester, Mass., on Sept. 26-27-28, 1917. Alvin A. Hunt, Secretary, 902 Main Street, Hartford, Conn.

AMERICAN SOCIETY OF ORTHODONTISTS.

The annual meeting of the American Society of Orthodontists will be held at Excelsior Springs, Mo. (30-minute ride from Kansas City), September 5, 6, 7 and 8, 1917. The program will be one of the best ever presented by the Society. All those interested in orthodontia are invited to attend.

CONNECTICUT DENTAL LAW.

(Substitute for Senate Bill No. 170)

Chapter 269.

An act providing for the education and examination of dental hygienists.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section twelve of chapter 316 of the public acts of 1915 is amended to read as follows: Any registered or licensed dentist may employ women assistants who shall be known as dental hygienists. Such dental hygienists may remove calcareous deposits, accretions and stains from the exposed surfaces of the teeth and directly beneath the free margins of the gums, but shall not perform any other operations on the teeth or mouth, or on any diseased tissues of the mouth. They may operate in the office of any registered or licensed dentist or in any public or private institution under the general supervision of a registered or licensed dentist. The dental commission may revoke the license of any registered or licensed dentist who shall permit any dental hygienist operating under his supervision to perform any operation other than that permitted under the provisions of this section. On or after July 1st, 1917, no dental hygienist shall be permitted to practice who has not registered with the recorder of the dental commission, unless such person shall pass an examination prescribed by the dental commission. The fee for such examination shall be ten dollars. Any applicant failing to pass such examination shall be entitled to a re-examination at the next meeting of the commissioners, without additional cost, and for any other additional examination a fee of five dollars shall be paid. The dental commission shall make such rules and regulations as may be necessary for the examination of dental hygienists. Said commission may issue its certificate to any applicant therefor who shall furnish proof satisfactory to said commission that she has been duly licensed to practice as a dental hygienist in another state after full compliance with the requirements of its dental laws, provided her professional education shall not be less than that required in this state. The dental commission may revoke the registration and license of any dental hygienist violating the provision of this act.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

By J. W. Beach, Buffalo, N. Y.

The Preparedness League of American Dentists has become the medium through which the dental profession at large is carrying on the work of preparedness for the great service that is ahead of it. For a year and a half this organization has been putting forth every effort to awaken our profession to the realization of the situation and had it not been for the unceasing labor of the organizers of the League surely we would have found ourselves in a deplorable state of unpreparedness when the stirring message that "War is upon us" was sounded from coast to coast.

The League has nearly 6,000 active members and more than 125 Sectional Units in active operation. Study courses are planned for these Units and several lectures with slides are furnished free of charge. This has proven a most effective means of preparing hundreds of our members for the entrance examinations to the Officers' Reserve Corps, Dental Section. We are gratified to report satisfactory progress in securing a splendid Dental Reserve for our Government, and we predict the establishment of the most efficient service in this important department of any nation.

Caring for the mouths of applicants for enlistment who are unable to pay for dental service is a most important object of the League, and we wish to take this opportunity to thank our members for the unparalelled response this phase of our work has received. We are proud of our profession and when the final reckoning shall come it will be shown that we have saved our country many thousands of fighters. The League has been designated the official medium for prosecuting this work and members are requested to report to our headquarters all cases thus cared for so that we may compile statistics to present to the Surgeon-General. The Government appreciates what we are doing and we believe our efforts will not go unrewarded when future favorable legislation may be desired by us.

We hope to bring many new members into the National Dental Association through the League and would call the attention of the Officers of our Units to this matter. We should bring many into the National before the annual meeting in October next.

The second annual meeting of the League will be held in conjunction with the N. D. A. on October 23, 1917, in Concert Hall, Hotel Astor, New York. We are planning a splendid program and will be able to report wonderful results from the different Units. Several dental ambulances for use in France are being supplied by our Units and other equally prtriotic movements are under way.

We urge the formation of Units more generally in order to promote the various objects of the League. Organization is essential and we would point out that *now* is the time our best efforts are demanded as the League is organized as a war measure; therefore, we invite correspondence with this object in view. Headquarters are at 131 Allen Street, Buffalo, N. Y.

PATENTS RELATING TO DENTISTRY.

1155541. Adjustable operator's seat for dental chairs, James B. Bardin, Chadbourn, N. C.
1155878. Tooth brush, Alba C. Booth, Burlington, Vt.
1155342. Mouth piece for saliva-ejecting apparatus, Wm. P. De Witt Somerville, Mass.
1155904. Artificial tooth, Everett B. Fewell, Madison, Ind.
1156106. Tooth-paste dispensing device, Russel S. Smart, Ottawa, Ontario, Canada.
1156446. Casting machine, Roger Taylor and L. A. Miley, Selby, Cal.
1157534. Artificial tooth facing with backing adjustment, Fred E. Hart, San Francisco, Cal.
1157309. Artificial tooth-facing and backing therefor, Gustav Holtz, Gouldsboro, Pa.
1157565. Combined dental prop and mirror, James E. Mayer, Bluefield, W. Va.
1157413. Tooth cleaner, John B. Nesper, Narbeth, Pa.
1157351. Dental chair, Henry E. Weber, Canton, Ohio.
1157759. Dental vulcanizer attachment, Theodore T. Cater, Columbus, Kan.
1158127. Emery wheel guard and supporting bracket therefor, Frederick Geiger, Cleveland, Ohio.

1158890. Dental floss holder, Clarence B. Bowling, Detroit, Mich.
1159206. Amalgam mixer, Nathan K. Garhart, Watertown.
1158732. Artificial tooth anchor, Wm. F. Shaw, Pueblo, Colo.
1158872. Dental tool, Frank W. Trabold and J. T. Knox, New York, N. Y.
1159469. Molding flask, Erle J. Byerlein, Saginaw, Mich.
1159496. Rubber dam clamp, James W. Ivory, Philadelphia, Pa.
1159971. Attachment for the plates of artificial teeth, Herbert T. McGowan, Praham, Victoria, Australia.
1159996. Dental chair, Frank Ritter, deceased, Rochester, N. Y.; A. R. Shumway and L. A. Ritter, executors.
1160114. Dental articulator, George B. Snow, Long Beach, Cal.
1160706. Making dental broaches, William W. Fowler, Washington, D. C.
1160805. Dental handpiece, Wallace Wood, Jr., New Orleans, La.
1161043. Tooth cleaning instrument, Morris Gallas, Kansas City, Mo.
1161141. Artificial tooth, Benjamin B. Lewis, Bridgeport, Conn.

Copies of the above patents may be obtained for 15 cents each by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, SEPTEMBER, 1917 No. 9

ATTACHMENTS TO VITAL TEETH.*

BY C. W. COLTRIN, D. D. S., CHICAGO, ILL.

Perhaps nothing pertaining to dental prosthesis is at the present time of greater interest and concern to the profession in general than that of making stable and efficient attachment to vital teeth for the purpose of retaining partial denture constructions without doing violence to their surfaces or substances, at least to an extent which will in any way endanger their vitality.

In attempting to write a paper on a subject of such importance and extensive scope as the one assigned to me for this occasion I find myself at the outset somewhat perplexed as to just what form it should take to present the subject in the most interesting and comprehensive manner.

With few exceptions, all forms of attachment devices applied to either living or pulpless teeth, have been fully described and discussed in the various journals and text books, most of them many times. In view of this fact, and that most of the more practical forms are in constant use in every day practice, it would seem that a paper on this subject to be of interest and value, should be confined to a discussion of the more recent inventions or new ideas.

However, upon looking the subject over it will be found, that perhaps with the exception of what the casting process has given us, we have little that is really new or original in the way of attachments to be used upon vital teeth.

While some new forms have recently been devised, which are undoubtedly valuable additions to our equipment, they are nearly all modifications of older forms and not new or original in principle. This, of course, is not to their discredit, as the discovery of a new and better application of an old principle, in any line of endeavor, is not only praiseworthy, but a great achievement.

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*Read before the Illinois State Dental Society, May, 1917.

Then as we are still dependent in a large degree upon the older forms to meet the urgent necessities of the present, thrust upon us by recent findings in regard to focal infections, which it seems will greatly increase the demand for attachments of this kind, it occurred to me that perhaps it would be well to take stock, as it were, of our entire equipment of this class of attachments by way of a general review of the whole subject.

This will not only bring before us what may be new in the way of devices of this description, but will also serve as a means whereby we will be able to renew acquaintances with many of the older forms, which though of unquestionable value and usefulness, have through indifference and neglect, been lost sight of and forgotten.

Having decided upon this course, I beg your indulgence and patience while I attempt by way of illustrations and short descriptions, together with brief outlines of technique of construction, to complete this task.

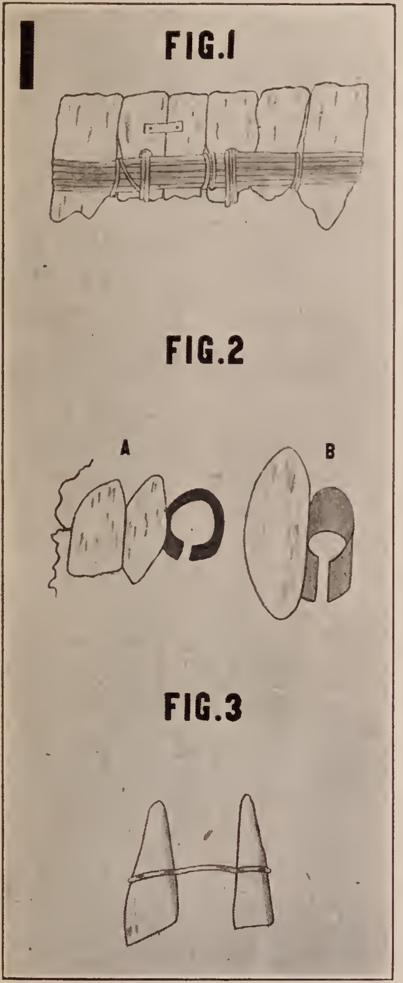
Before entering upon the subject, however, I wish to state that this paper is largely a compilation and that some of the illustrations and descriptions used are taken from the works on prosthetic dentistry by Prothero, Wilson, Turner and others, and that the author makes no claim of priority or originality in presenting any of the forms of devices herein described.

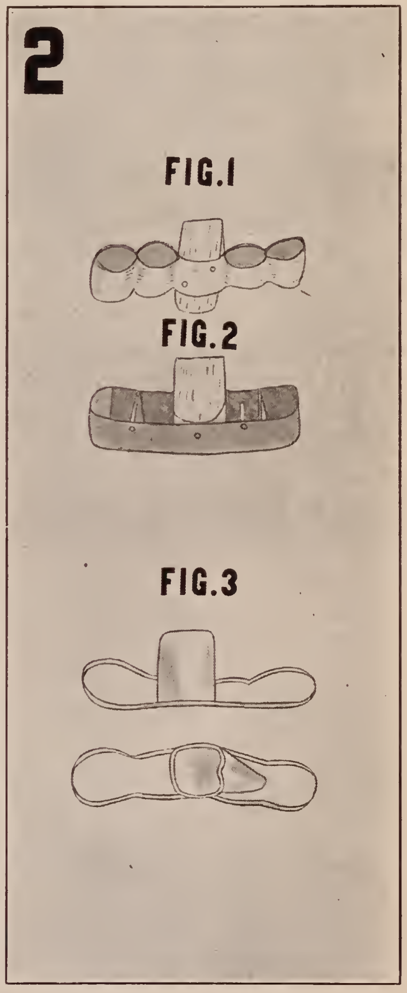
The subject is naturally divided into two general classes of attachments; first, removable or detachable devices which are applied without mutilation or destruction of the tooth surfaces; and second, attachments which are permanently secured to the anchorage teeth, and requiring more or less mutilation of the tooth surfaces and substance in their application.

To avoid confusion the general plan will be to consider each of these classes separately, beginning with the removable forms.

The problem of making efficient and stable attachment to vital teeth for the purpose of retaining partial denture constructions has taxed the ingenuity, skill, and inventive ability of dental practitioners, from ancient to modern times.

The same difficulties and perplexities which are confronting us today were in a degree met and dealt with by the ancients, and strange to say, with all our advancement in other lines we have contributed very little in this field that is new or that differs materially in principle from the means which they employed. As evidence of this fact, and to add interest to the subject, by way of comparison, a few pictured specimens of ancient dental art are given here.





On Chart 1, Fig. 1, the wire ligature, which is perhaps the most primitive of all forms of metal attachments to vital teeth, is shown. In this specimen the substitutes for the missing teeth are bound together and ligated to the remaining natural teeth by means of a wire ligature—presumably gold wire. From this simple form the numerous forms of wire attachments in use at the present time have been developed.

In Fig. 2-A the wire ligature is used in conjunction with a metal band clasp. Thus we find the band clasp, one of the most universally used attachments in modern dentistry, dates back to ancient times.

In Fig. 2-B a band clasp is shown carrying a cuspid which is "swung in" much in the same manner as it is done today. This specimen is also of interest because it shows that removable partial denture construction were appreciated and used long before the advent of modern dentistry.

In Fig. 3 we have a wire splint construction which perhaps was also used to support a substitute for the missing tooth. This specimen is of Etruscan workmanship, and dates back to the century just preceding the Christian era.

On Chart 2, Figs. 1-2, two specimens of ancient bridge work are shown. These specimens are of Egyptian and Etruscan workmanship. The missing teeth were supplied by inserting substitutes of teakwood or ivory into the sockets or boxlike compartments, some of which also served as a means of anchorage for the bridge by telescoping the abutment teeth. Natural teeth were sometimes used as substitutes for the missing teeth in these constructions.

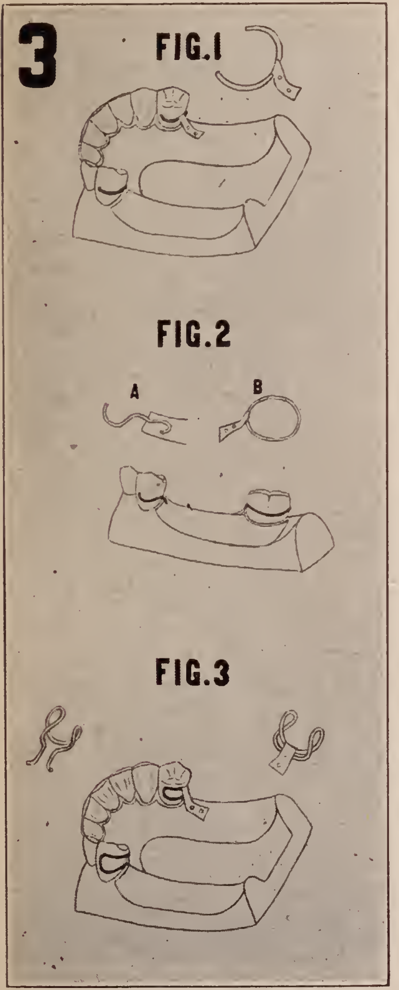
In Fig. 3 a specimen of ancient gold crown work is shown. "This specimen is of Roman workmanship. The crown which is made for a lower incisor consists of two pieces of gold, stamped to represent the labial and lingual surfaces and united with solder just as the Hollingsworth two-piece anterior shell crown is joined together. It is held in place by an elongated band of gold which is looped around the adjacent teeth." (Prothero.)

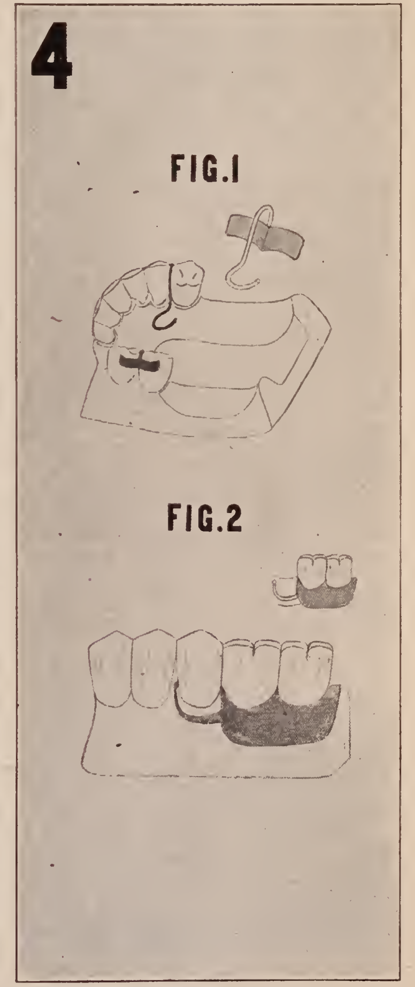
This brief resume will serve to give some idea of how the problems of retention were solved in ancient times.

WIRE CLASP GROUP.

Coming down to what may be termed modern dentistry we find several forms of wire attachments in use, most of which are so familiar that they will require no detailed description here.

The value of gold wire as a means of retaining partial dentures undoubtedly appealed to the ancients for much the same reasons it does to us. First, because of the ease with which it can be adapted to the purpose, second, because it is noncorrosive in the fluids of the mouth, and third, because of its slight contact with the tooth surfaces it is not prone to cause decay.





Besides the qualities just mentioned, it has when made from gold which is properly alloyed, considerable resilience, which property has caused it to be used as the basic principle of a large group of removable or detachable devices.

Among the earlier forms of this group are those shown on Chart 3, in Figs. 1, 2, 3.

The form shown in Fig. 1 is simply a round clasp gold wire, fashioned to partly encircle the anchorage tooth, which it clasps by springing over and gripping the surfaces beneath the buccal and lingual contours.

The form shown in Fig. 2-A is a short clasp or stay applied to the buccal or lingual surface to prevent lateral movement of the denture, which is more rigidly retained by other means.

In Fig. 2-B still another form calleed the Hoop Clasp is shown, in which the wire entirely encircles the anchorage tooth. These same forms are also made from half-round wire for use upon short, straight sided teeth. The half round wire having a wider contact with the tooth surface and consequently a greater gripping power is best adapted to this purpose.

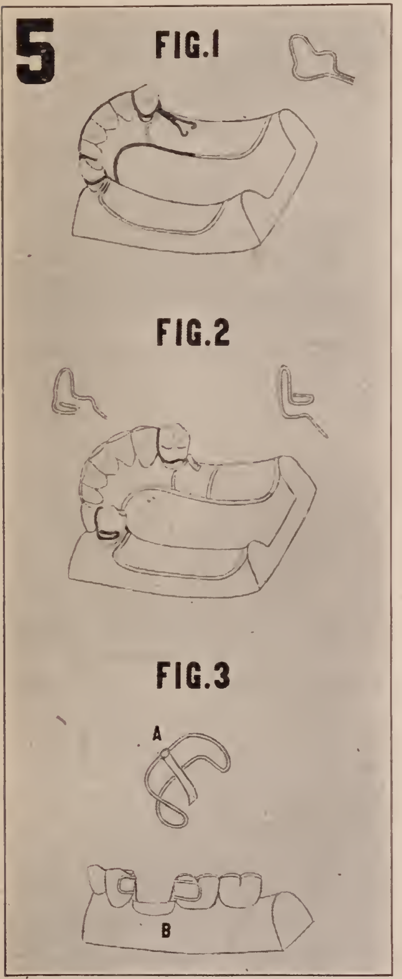
In Fig. 3 the form known as the bow or basket clasp is shown, which is also one of the older forms. This clasp is used in clasping bell shaped bicuspids and molars; the bows springing over and gripping the opposing convexities of the labial and lingual surfaces.

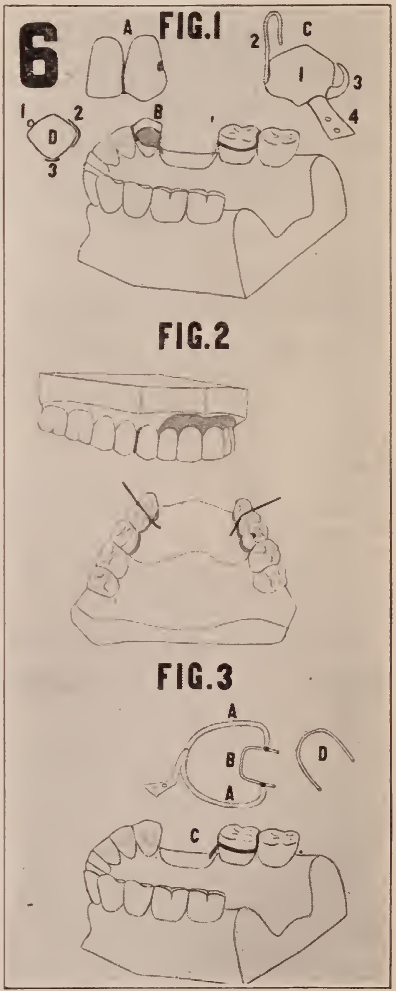
Next we have two unique forms of attachments; one of which belongs to this period, the other being, perhaps, of more recent design. Though never extensively used, in this country at least, these devices are interesting by way of comparison and are given here simply to complete the grouping of wire attachments.

Chart 4. First in Fig. 1 is the form known as the Balkwell Clasp (introduced about 1880). "This clasp consists of a strip of clasp metal which is conformed to the buccal surfaces of two approximating teeth and joined to the saddle by a wire loop which passes over the occlusal."

Second, in Fig. 2, is a form of attachment known as the Heinrickson Partial Loop Ball-pointed Clasp. This clasp consists of a clasp gold wire or bar with a ball terminal at its free end. The bar is anchored to the buccal side of the saddle just distally to the anchorage tooth. It is then bent downward and forward below the gingival region to the mesial side of the anchorage tooth, where it is carried occlusally into the embrasure with the ball end resting on the mesio-buccal surface close to the gingiva. The device operates by clasping the anchorage tooth mesio-distally; the ball pressing on the mesial surface and the approximating supplied tooth on the distal. This device is of comparatively recent design.

With the exception of those shown on Chart 4, in Figs. 1 and 2, the attachments thus far considered mainly comprised the wire clasp equipment of the practitioner of thirty or forty years ago. That these simple devices were of value and served the previous generations faithfully and well is, I think, fully attested by the fact that they are all to some extent in use at the present time.





For a number of years little interest was taken in wire attachments. The fact that the older forms were inefficient except in a small range of cases necessitated the substitution of other forms of retention devices, which were more reliable and better adapted to universal application.

Within the last few years, however, new interest has been stimulated in the use of these attachments due to the efforts of a distinguished member of this society, Dr. F. E. Roach, of Chicago, who, recognizing their wonderful possibilities, undertook the development of new and more efficient forms. By untiring and persistent effort Dr. Roach has worked out and presented to the profession a group of wire retention devices which bid fair to solve in a large degree one of the most difficult problems in removable partial denture construction; which is, efficient attachment to vital teeth, without doing violence to their surfaces or substance.

In considering this group of attachments the first in order will be the form known as the wire loop clasps. As these clasps have recently been fully described but brief mention will be made of them here.

THE WIRE LOOP CLASP.

The wire loop clasp is made in two forms, namely: the continuous loop form which is shown on Chart 5, in Fig. 1, and the open loop form shown in Fig. 2.

The continuous loop form is particularly useful in clasping cuspids or short, straight-sided bicuspids, while the open loop form is more adaptable to clasping teeth with considerable contour, such as the bicuspids. It may be said of these clasps that they differ in operation from most of the older forms in that they grip the anchorage tooth mesio-distally, instead of bucco-lingually. This permits of their being successfully applied to teeth which because of their lack of bucco-lingual contour were heretofore considered difficult if not impossible to clasp. It may also be said of these clasps that they are rather difficult to make; a fact which has greatly retarded their general use, because when improperly constructed and adapted they fail to give efficient service.

Perhaps it will be well to mention here that to properly construct this group of clasps it will first be necessary to have a perfect impression and a suitable cast.

The impression should be taken with modeling compound by the sectional method which will give a correct copy of all exposed surfaces of the teeth to be clasped. The cast should be made of a hard, dense material which will stand rough usage, such as Spence compound or Weinstein material. The technique of impression taking for clasp construction will be given later in the section devoted to band clasps.

THE DOUBLE BOW CLASP.

Next is the form called the double bow clasp, shown in Fig. 3-A.

This clasp, which is a modification of the basket clasp, Fig. 3, Chart 3, was devised for use in retaining small removable bridges of one or two teeth, as shown in Fig. 3-B. It consists of a round clasp gold wire (18 or 20 gauge as the case may require) which is bent to form a semi-circular double loop, the occlusal strand being continuous while the gingival strand is divided midway between the bows. The stay or lug by which the clasp is secured to the saddle is attached to the center of the occlusal strand, and extended gingivally to the saddle opposite the opening in the gingival strand, Fig. 3-A. The clasp operates bucco-lingually, the bows springing over and gripping the buccal and lingual contoured surfaces of the tooth. Like the wire loop forms, these clasps are difficult to make and are of use only in special cases.

THE MESSIO-DISTAL GRIP CLASP.

Another and more recent form is shown on Chart 6, Fig. 1.

This attachment is called by Dr. Roach, the "Messio-distal-grip Clasp." As its name implies it operates by gripping the anchorage tooth mesio-distally, as shown in A and B. The attachment consists of two or three parts according to the necessities of the case in hand. When applied to the anterior teeth, especially the cuspids as at (B), it is made in three parts, as follows: First, a gold plate is made to fit the lingual surface of the anchorage tooth, covering sufficient surface to give a good bearing without interfering with the occlusion of the opposing teeth. This plate or bearing may be made either by burnishing pure gold or platinum plate to the surface to be covered and strengthening with solder, or by swaging a piece of 22K plate, or by the casting method, whichever is most convenient. After the lingual plate is properly fitted it is placed upon the model. Next a round clasp gold wire 18 or 20 gauge is soldered to the messial side of the lingual plate and carried over the occlusal into the buccal embrasure resting upon the mesio-buccal surface of the anchorage tooth as shown in Fig. A. Next a piece of half round clasp wire or plate is soldered to the distal side of the lingual plate and bent around the distal surface of the anchorage tooth forming the distal grip (A-B). Thus we have the three parts; the lingual plate resting upon the lingual surface of the anchorage tooth forming a stop to prevent the attachment from being forced gingivally (C-1), the mesial grip, formed by the wire loop which passes over the occlusal and presses against the mesio-buccal surface (C-2) and the distal grip, formed by the short clasp which passes around the distal surface (C-3).

Finally a lug is soldered to the lingual plate for use in securing the attachment to the saddle or base (C-4).

In cases where this attachment is applied to bicuspids it is made in two pieces, the messial and distal grips being united on the lingual and attached to the saddle or base.

In the diagram (D-1-2-3) application of the complete device is shown, giving the three points of contact with the tooth surfaces. This device has great gripping power and stability. These, together with its wide range of adaptability, renders it of unquestionable value as an attachment to vital teeth which can be used in many cases as a substitute for the band clasp. A simplified form of this clasp (of which there are several modifications) is shown in Fig. 2, in which the wire clasp is soldered to or imbedded in the base, thereby eliminating the lingual plate. In the cut the wire clasps are shown partially bent over the occlusal, the final adaptation being made with the completed denture in place in the mouth.

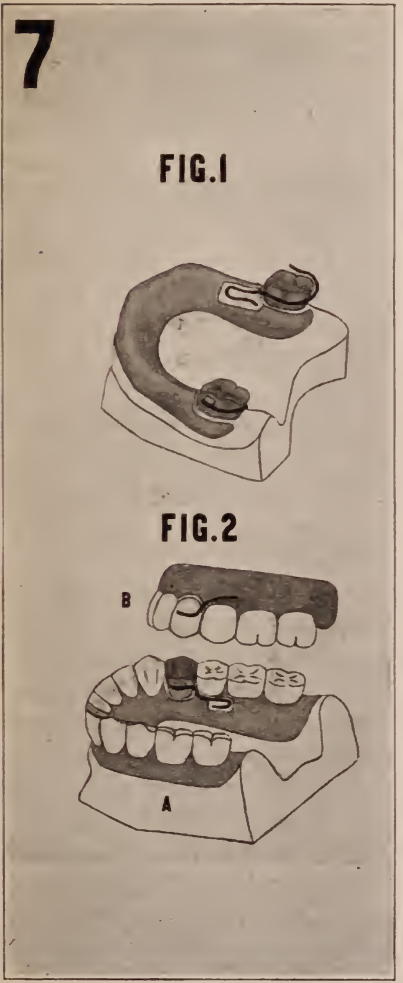
MODIFIED WIRE LOOP CLASP.

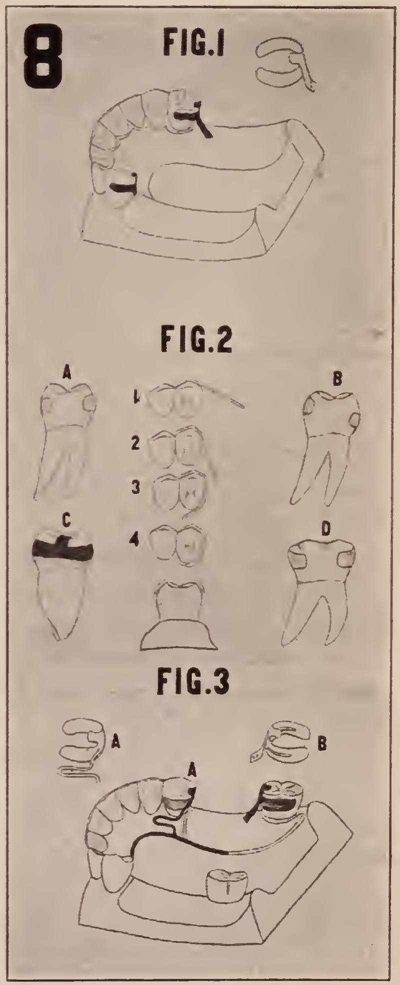
In Fig. 3 a modification of the wire loop clasp is shown.

Instead of being made from one continuous piece of round wire as were the older forms, this clasp is made in two parts and of both round and half round wire.

The clasp consists of the horizontal spans A-A, which engages two-thirds of the circumference of the anchorage tooth, and a vertical bow (B) which passes over the occlusal.

The horizontal spans are made from a single piece of half round clasp-gold wire about 15 gauge. If the vertical bow is applied distally as shown at (C) the spans are formed by adapting the half round wire to the buccal mesial and lingual surfaces of the anchorage tooth, extending from the disto-buccal angle mesially around the buccal mesial and lingual surfaces to the disto-lingual angle.





The vertical bow is made of round clasp gold wire 18 or 20 gauge. The wire is bent into the form of a staple-like bow (D). This is placed vertically over the occlusal with its terminals passing gingivally into the embrasures, along the disto-buccal and disto-lingual surfaces of the anchorage tooth, where they meet and are joined by soldering to the terminals of the horizontal spans (B).

The clasp operates principally by gripping the anchorage tooth messio-distally; but as it also grips the tooth bucco-lingually to some extent, it may be said to have a double or continuous grip upon the tooth circumference.

The vertical bow resting against the disto-buccal and disto-lingual surfaces gives a strong bearing upon the distal, while the horizontal spans passing around the buccal, mesial and lingual surfaces serve to form the bearings which produce the two different forms of grip.

The vertical bow not only adds rigidity to the clasp but permits of its being applied at the end of a series of approximating teeth as at (C). It further serves as a means of tightening, which is accomplished by compressing its sides. The advantages claimed for this form of clasp are as follows:

First, simplicity of construction; second, wide range of adaptability; third, rigidity and stability of attachment; fourth, mesio-distal grip which gives it a firm hold on teeth with little or no bucco-lingual contour.

THE ELDRED ATTACHMENT.

On Chart 7, in Figs. 1 and 2, a new form of wire attachment is shown devised by Dr. John F. Eldred, of Chicago.

As this attachment does not depend upon tenso-frictional gripping of the tooth circumference it is not a clasp. It is perhaps best described as a spring latch. The spring which is made of about 20 gauge wire, is attached to the saddle or base on the linugal side of the anchorage tooth, and is sprung over the occlusal and latched beneath a lug on the buccal surface, as shown in Fig. 1. The form shown in Fig. 2-A is applied on the lingual side; the stay clasp (B) on the buccal serving to give the spring sufficient grip upon the anchorage tooth to keep it in place beneath the lug. While this device is readily adaptable to anchorage teeth which are crowned with gold shell crowns, it can also be applied to vital teeth by inserting an inlay for the purpose of forming a lug for catching the spring.

This attachment is new and practically untried, consequently the author will not venture an opinion as to its value.

THE BAND CLASP.

The band clasp, like the wire attachment, dates back to the ancients. Unlike the latter, however, it has come down to us practically unaltered in form and is used today much in the same form as it was in ancient times.

This attachment has been the most universally used of all forms of retention devices known to partial denture construction. This has no doubt been due to the fact that, while it has many faults, it also has many qualities or requisites which render it efficient and reliable to a greater degree than any other form of removable attachment which is applied directly to the tooth surface. Principally among these qualities are its simplicity of construction, stability of retention and wide range of adaptability. I shall not attempt to discuss the merits or demerits of band clasps as attachments to vital teeth. I will only state that all that has been said or written in condemnation of band clasps which are improperly constructed and poorly adapted to the tooth surfaces is, without doubt, fully justified. But, when properly constructed and accurately adapted, with means provided to prevent their coming into contact with the gingival tissues, they are not harmful or destructive to a degree which warrants severe criticism or renders them prohibitive for use upon vital teeth in partial denture work.

The band clasp is made in but one general form as shown on Chart 8, Fig. 1. While this attachment has changed but little in form since ancient times it has however been somewhat modified and improved to meet the needs of a more progressive age.

First, it has been greatly improved in general outline and manner of its application to the tooth surfaces (Fig. 2-A-B-C-D). Second, it has been further improved by the addition of the occlusal rest or stop, which prevents its being forced gingivally and coming into contact with gingival tissues (C). Third, it is in certain instances modified to increase its resiliency and stability (Fig. 3-B). As the technique of constructing the band clasp is fully given in recent treatises on prosthetic dentistry it will be unnecessary for me to dwell upon the subject here.

I wish however to call attention to a few general principles pertaining to its formation and adaptation to the tooth surfaces and give the technique of taking an impression and forming a metal die or cast for general clasp construction.

In form, a band clasp should consist of a strip or band of clasp gold plate about 26 gauge which is closely adapted to the periphery of the tooth extending about two-thirds around its circumference and embracing two or more opposing convexities. It should be of sufficient width and thickness to insure stability of retention and inherent strength.

To further insure stability and to prevent its being forced out of position gingivally, a lug or stop should be soldered to the occlusal margin and extended occlusally over the mesial or distal marginal ridge, as in Fig. 2-C. As the efficiency of this attachment depends upon the amount of frictional contact obtained it must be closely adapted to the tooth surfaces. This is not easily accomplished by simply bending and fitting the band to the tooth with a pair of pliers. To obtain the necessary closeness of adaptation throughout the entire length and breadth of the band it should be constructed on a metal die to which it can be fitted by bending with pliers and finally adapted with the mallet and hammer (Fig. 2 1-2-3-4). This brings us to the making of the metal die, which must be an exact copy of the anchorage tooth with all its contours and undercuts perfectly reproduced. The technique of taking the impression and making the die is as follows:

There are three different methods by which this procedure may be successfully carried out devised by three of our leading teachers of prosthetic dentistry. While these methods do not materially differ as to principle and final accomplishment, they differ somewhat by way of the means employed.

PROTHERO METHOD.

First is Dr. Prothero's method. Chart 9, Fig. 1.

As this method is fully described and illustrated in Dr. Prothero's work on "Prosthetic Dentistry," I will simply call attention to it here by way of a few illustrations and briefly outline the technique. In this method a hinged tray is used, made either from cardboard, as shown in Fig. 1-A, or from an ordinary metal hinge as in Fig. 1-B, the application of the tray being shown in Fig. 1-C. The tray being jointed messio-distally, is easily removed from the impression by simply opening the hinge. After removing the tray the plaster is notched and split from the tooth or teeth. The sections are then replaced in the tray and the impression built up and reinforced for pouring the metal die.

Second, in Fig. 2, the method devised by Dr. W. E. Cummer, of Toronto, Canada, is given.

This method is especially effective and useful in taking impressions of teeth which are standing alone with no approximating teeth on either side, as in Fig. 2-E.

The technique of making the special tray which is the important feature of Dr. Cummer's method, is as follows:

A strip of air chamber metal (or some other suitable metal) is cut into a form which corresponds to the arc of a circle as shown in Fig. 2-A. This curved strip of metal is bent around a tapering ring stake and the free ends brought together extending outwards as in Fig. 2-B. This gives a round, tapering, dipper-like tray with the free ends of metal strip forming the handle, Fig. 2-C. The small end of the tapering cup is then covered with base plate wax to form a bottom and the tray is ready for use, Fig. 2-D. In taking the impression the tray is filled with plaster and inverted over the tooth as in Fig. 2-E. After plaster has hardened the tray is removed, leaving the plaster in place upon the tooth. This is accomplished by slightly springing the free ends of handle apart which will release the tray from plaster, and the cup part of tray, being tapered, will readily lift off of the impression. After tray is removed a cut is made in plaster mesio-distally across the occlusal surface of the impression, which will permit of its being divided into two sections and removed from the tooth without distortion, Fig. 2-F. After the impression is removed from the tooth the sections are replaced in tray and held securely in place by clamping the free ends of the handle together with a paper clip, as shown in Fig. 2-G. The impression is then gently heated to drive out all moisture from the plaster. After this is done a piece of cardboard or stiff paper is wrapped around cup extending above the impression to hold enough metal to form a base for the metal die after it is poured. The paper is held in place by the clip which clamps the handle of the tray, as shown in Fig. 2-H. The metal is then poured and the die is formed as in Fig. 2-I. If care is taken in following this technique a metal die can be procured which will be a perfect reproduction of the tooth which is copied and of unquestionable value as an aid in constructing a perfect band clasp.

Third. Dr. F. E. Roach's method is given.

This method was devised by Dr. Roach for taking sectional modeling compound impressions and making casts of Weinstein material for general clasp construction.

First, special metal trays are made for use in taking each section of the impression. These trays can be made from any piece of metal at hand which is moderately stiff yet pliable enough to be bent into the required form. The lingual tray, Fig. 3-A, is shaped to approximately conform to the lingual surfaces of the teeth and arch extending anteriorly sufficiently to insure ease in handling. The buccal tray, Fig. 3-B, is simply a strip of metal shaped to approximately conform to the buccal surfaces. After the trays are formed they should be roughened or punched (as shown in A-B) to give retention to the compound.

The lingual section of impression is taken first. The compound is softened in hot water applied to tray and pressed well over the lingual and occlusal surfaces of the teeth and adjacent tissues. Fig. 3-C. After chilling, remove and trim compound to a sharp shoulder midway between buccal and lingual along the occlusal surfaces of the teeth and space. Next soften the surface of compound by passing through flame, temper in hot water and press quickly and firmly to place. Chill, remove and retrim. After this section is accurately fitted to all contours and undercuts, the buccal section, Fig. 3-D, is taken. This is accomplished by holding the lingual section firmly in place on the lingual side, while with the buccal tray the softened compound is pressed over the buccal surfaces and against the shoulder of the lingual section. After being thoroughly chilled the sections are carefully removed and fitted together for running up the cast.

COMBINATION PURE GOLD AND CLASP METAL CLASP.

Another method of adapting a band clasp to the tooth surfaces is that by which a piece of pure gold is first burnished to the surfaces to be occupied by the clasp; after which a clasp metal band is fitted over the gold and the space between the two filled in with solder.

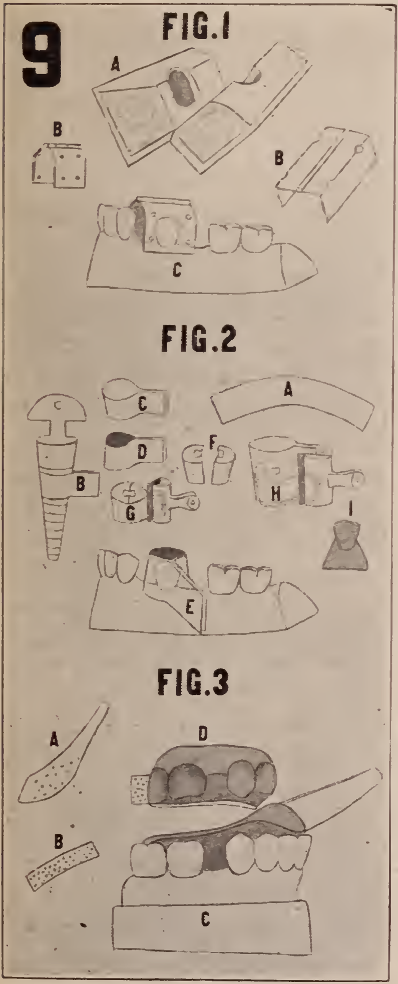
This method requires an impression of the tooth to be clasped and a cast or die of some hard investment material. This is necessary as the parts must be soldered together while upon the cast to prevent distortion of the gold matrix.

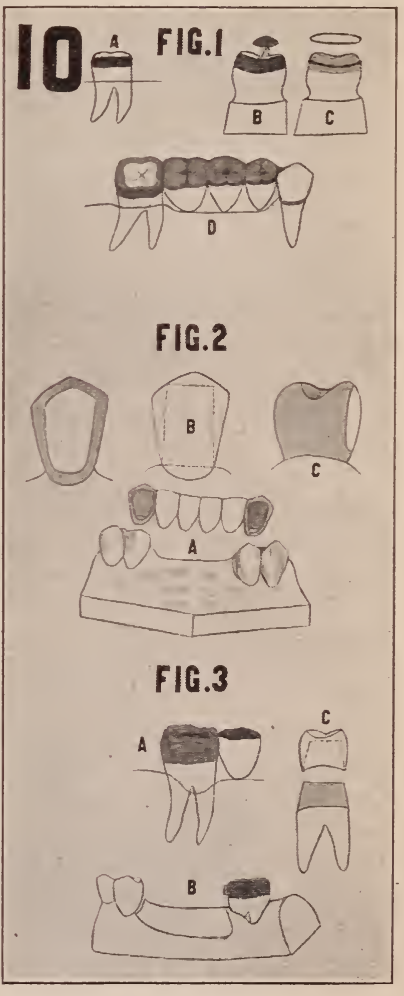
No particular advantage is gained by the use of this method for the reason that the gold is soon worn down and the desired frictional contact lost; besides, a clasp made in this manner is not as resilient as a full clasp metal clasp.

THE GRASSHOPPER LEG DEVICE.

On Chart 8, Fig. 3-A-A, a device is shown commonly called the grasshopper leg attachment.

This device is not in itself an attachment, but rather an adjunct to the band clasp and other more or less rigid attachments, such as the split-pin or split bar types.





Because it serves as a means of relieving the strain upon the abutment teeth, which is more or less great in all cases where rigid attachments are used, this device is of great value and importance in partial denture construction.

The grasshopper leg device has been more or less extensively used by such well known prosthetists as Louis J. Weinstein of New York City and Dr. Dayton Dunbar Campbell of Kansas City, Mo., and largely through their efforts it has been brought to a high degree of efficiency and reliability.

The following description and brief technique of construction, which also includes the making of a cast band clasp, is taken from the writings of Dr. Dayton D. Campbell:

"The function of this device is not to compensate for settling, but is rather a provision for the resiliency of the tissue in the area underlying the base. The stress of mastication is distributed between the spring and the mucosa, the stress falling first upon the spring, which yielding, allows the stress to be exerted finally against the mucosa itself; as soon as the stress is removed the spring is released from its state of tension and the mucosa then returns to normal.

Thus, this adjunct allows the mucosa to remain normal and, therefore, requires in the clasp or other device no subsequent alteration such as is required when the tissues permanently recede. Another advantage—almost too obvious to mention—attends the use of this adjunct, namely: the absence of harmful leverage on abutment tooth, since we are enabled to direct the force of mastication along a line more nearly parallel with the long axis of the tooth.

During the past five or six years the highest grade of clasp gold on the market has been used in its construction, but the limit of elasticity of all grades was soon reached and the molecular tension developed under constant use caused the leg to break at the knee. This difficulty has been eliminated since the introduction of elastic gold according to Louis K. Weinstein's formula. This gold is found to possess the "spring" quality necessary to assure the grasshopper leg adjunct a permanent place in prosthetic dentistry.

The construction of clasp and leg is, briefly, as follows: An inlay-investment reproduction of the tooth to be clasped is waxed up to include two opposing convex surfaces and an occlusal rest. The tooth and wax pattern are then invested and the usual inlay procedure is followed—except that a twelve per cent platinum-alloyed gold is used, which properly may be designated as clasp metal. The secret of success in casting clasps lies in casting them at the lowest temperature possible, since incandescence permits a destruction of the balanced relationship among the elements of the clasp metal. The Elastic Gold is not used for clasps on account of its color.

The leg is constructed, in most instances, of sixteen gauge Ney's Oro Elastic Gold Wire. After bending the wire at right angles it is annealed and further bent back upon itself, and the whole adapted to meet the needs of the individual case, one end being soldered to the clasp and the other end left free until assembled in the mouth. The base to receive the clasp is waxd up with hard pink base-plate wax, the procedure being the same as that followed preparatory to taking the bite, except that a space about ten millimeters in width is left between the wax and the abutment tooth, that is, the tooth which is to receive the clasp. The clasp is placed in position on the tooth and the base is inserted; the patient is requested to close and the base is settled into place; plaster is now inserted between the abutment tooth and the base, and this relation maintained until the plaster is hardened sufficiently to be removed. The whole is invested in bridge-investment material and the lower portion of the leg soldered to the lingual bar of the gold base—or in the event of a vulcanite base, the lower portion of the leg is extended back into the rubber sufficiently far to insure stability when vulcanized.

The fact that the Grasshopper Leg Adjunct may be used with any unyielding appliance in order to assist in preserving a natural resiliency, accounts for the widespread favor it is gaining with teachers of advanced prosthetic dentistry.

CAST CLASPS.

Clasps which are made by the casting method have not generally proven to be a success.

When constructed in this manner they lack resiliency, and on account of the crystaline character of the clasp metal when cast, they are somewhat easily broken. As all metals have a tendency to become crystaline when cast, it is somewhat doubtful if satisfactory clasps can be made by this method.

This brings us to the forms of attachment devices which, in their application, require more or less destruction of the surfaces or substance of the anchorage teeth.

STATIONARY BAND OR RING ATTACHMENT.

Chart 10, Fig. 1.

This form of attachment, Chart 10, Fig. 1, consists of a continuous band or ring, which is adapted to the periphery of the occlusal third of the anchorage tooth, extending slighly upon the occlusal to prevent its being forced out of position gingivally.

It is made in two ways: Either by adapting a 22K band to the surfaces and crimping the occlusal border of the band over the occlusal (Fig. 1-A), or by the casting method (Fig. 1-B). When made by the casting method the technique is briefly as follows:

First, the surfaces to be covered are slightly ground to obtain separation from approximating teeth and to parallel sufficiently to permit the gingival and occlusal borders of the ring to fit closely to the tooth surfaces when the attachment is forced to place.

Second, a modeling compound impression is taken and a cast run up in inlay investment.

Third, a high fusing clasp metal or platinum wire is formed into a hoop, which is fitted over and upon the cast, as in Fig. 1-C.

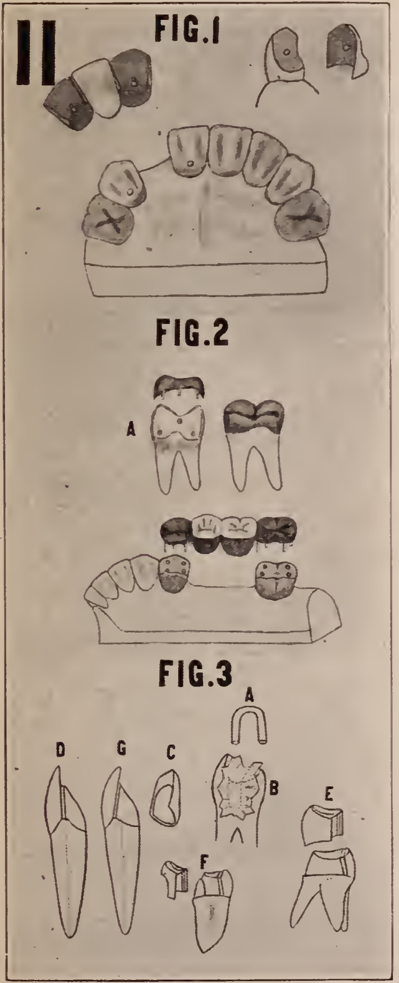
Fourth, a wax pattern is built upon the cast, covering the wire hoop which, in casting, becomes embedded in the substance of the ring, thereby adding materially to its strength.

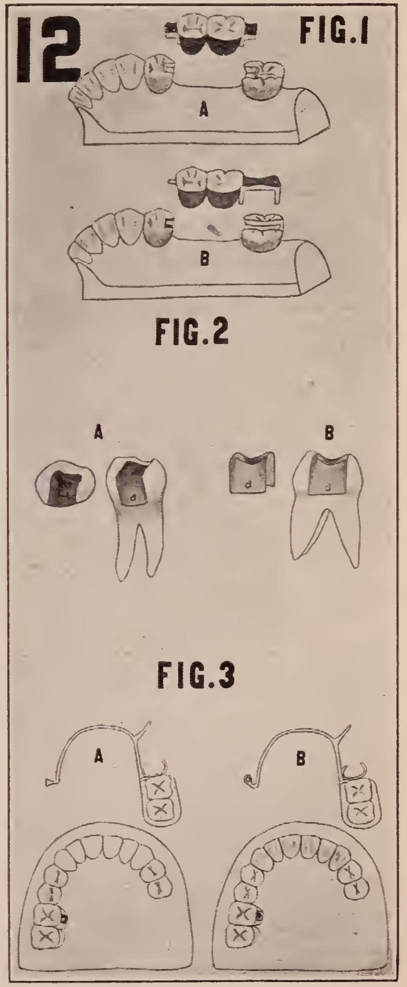
After the wax pattern has been carved to desired form the sprue wires are attached and the cast with wax pattern and hoop in place upon it invested and the attachment cast in the usual manner (Fig. 1-B). This attachment, as its name implies, is stationary, being attached to the anchorage tooth by cementation. It is particularly useful in making attachment to the molar teeth, as shown in Fig. 1-D.

THE OPEN FACED SHELL CROWN OR SO CALLED SLIPPER ATTACHMENT.

This attachment has been extensively used upon vital teeth as a means of anchorage in fixed bridge work, being most generally applied to the anterior teeth (Fig. 2-A). Like the band clasp, this attachment has been so much abused that it is now looked upon by most practitioners as ruinous and altogether unfit for use. Its abuse has largely come about because of the comparative ease with which it can be constructed and applied, together with the fact that although poorly adapted to the gingival surfaces it will, in most instances, give rigid attachment for a time at least.

This form of attachment besides being unsightly is, in most cases, contradicted because of the necessarily extensive destruction of the incisal or occlusal third of the tooth to secure close adaptation of the band to the gingival surfaces (Fig. 2-B). While these attachments have, in many instances, given efficient service for many years, without apparent injury to either the tooth or adjacent





tissues, they are, in most cases, injurious and destructive. Consequently, if used at all they should be limited to cases where the anchorage teeth are somewhat conical in form, which will permit of the gingival portion of the band being closely fitted to the tooth surfaces without extensive mutilation. When applied to the bicuspid teeth (Fig. 2-C) they are perhaps no more objectionable than the full shell crown, but are generally about as unsightly.

Fig. 3—The Three-quarter Gold Shell Crown.

The gold shell crown, with its band extended beneath the free margin of the gum, has been quite extensively used upon vital teeth as a means of attachment in fixed bridge work, and removable partial denture construction. This is, perhaps, good practice where the gum is normal, and it is possible to fit the band closely to the gingival surfaces of the tooth. But in cases where the gum has receded to an extent which leaves the gingival surfaces exposed to the bifurcation of the roots (Fig. 3-A-B) it is almost impossible to fit a band that will be close enough to prevent an objectionable shoulder. In this class of cases the three-quarter shell crown is indicated (Fig. 3-A-B). While it may be said that by leaving the gingival third of the tooth exposed, with the shouler above the gum, the exposed surfaces will most surely decay, it may also be said that if the shoulder is placed beneath the gum it will as surely produce destruction of the gingival tissues. Thus, between the two evils it would seem that if we choose the least it would be the former, because if the surfaces decay they can easily be repaired and the life and usefulness of the tooth materially prolonged. It is, I think, safe to say that if a three-quarter shell crown is placed in the mouth of a patient who takes reasonably good care of the teeth, it will give lasting service with little danger of destruction of the exposed surfaces by caries. On the other hand, in mouths that are not properly cared for the chances are, of course, not so good. The proper use of this form of attachment is then altogether a matter of good judgment on the part of the operator.

THE TELESCOPING CROWN.

The telescope crown is sometimes used to good advantage upon vital teeth for attachment purposes, in removable constructions.

This device consists of a gold cap, which is fitted to and cemented upon the anchorage tooth, over which a gold shell crown is fitted, as in Fig. 3-C.

Retention is obtained by frictional contact of the inner surfaces of the telescoping shell upon the axial surfaces of the root cap.

"The technique of its construction is briefly as follows: The tooth is prepared as for a shell crown, its axial surfaces being slightly tapering and its occlusal surface ground flat. The cap is fitted to conform to the conical shaped tooth preparation, after which is removed and mounted upon a wooden mandril, with modeling compound, and its surfaces smoothed and polished. It is then removed from the mandril, its inner surfaces coated with whiting to prevent die metal from adhering to its surfaces, and imbedded in mouldine, occlusal end down. A metal die is then cast over it. Next the band for the outer shell, having the same taper, is fitted over the root cap and driven or swaged to place. The entire band is then removed and its occlusal end covered by a piece of gold plate, leaving at least one-sixty-fourth of an inch of space between the top of the root cap and the outer shell. The parts are then put in place upon the tooth and a bite taken, after which they are transferred to the articulator and the outer shell completed by the usual casting method." (Prothero.)

THE PIN AND PLATE ATTACHMENT.

Chart 11, Fig. 1.

This attachment is particularly useful in cases where a single anterior tooth is to be supplied.

It consists of a gold plate or hood which is adapted to the lingual surface of the anchorage tooth, to which it is attached by means of a short-headed pin. First, the plate is burnished or swaged to fit the lingual surfaces, after which corresponding holes are cut in both plate and tooth to accommodate the pin, which is soldered to the plate with the headed end projecting into the hole in the tooth. The attachment is secured to the tooth by cementation.

THE PIN INLAY ATTACHMENT.

In Fig. 2 a modification of this form is shown as the pin inlay attachment.

A simple technique for constructing this device is as follows: Prepare the surface of the tooth in a manner which will produce somewhat definite margins surrounding the area to be covered (Fig. 2-A). Drill holes for retaining pins in the dentine at points which will be safely away from the pulp. Burnish matrix of platinum foil or pure gold over surface and insert pins through matrix. Wax pins to matrix, remove and solder. Next, replace on tooth and burnish the matrix closely to the surfaces and margins. Finally, build up occlusal surface with inlay wax and cast. After casting, if in doubt of union between casting and matrix, they can be united by soldering. In Fig. 2-B this attachment is shown applied to a fixed bridge.

THE CARMICHAEL ATTACHMENT AND ITS MODIFICATIONS.

Chart 11, Fig. 3.

This attachment was devised and introduced to the profession a number of years ago by Dr. Carmichael of Milwaukee. The original form, shown in Fig. 3-A-B, is constructed as follows:

First, a groove is cut in the mesial, occlusal and distal surfaces of the anchorage tooth, extending from the gingiva on the mesial over the occlusal to the gingiva on the distal. Second, a pure gold or platinum matrix is adapted to the surfaces extending down into the groove (Fig. 3-B). Third, a clasp metal or iridio platinum wire is formed into a staple, which is fitted over the matrix and into the grooves (Fig. 3-A). Finally, the staple and matrix are waxed together, removed, invested and flushed up with solder. The margins and surfaces are then trimmed and polished and the attachment is ready for use. This attachment, when properly constructed, is both efficient and reliable, being particularly adaptable to the cuspid and bicuspid teeth. When the casting method came into use the construction of this attachment was modified to conform to the cast inlay technique, which increased its range of adaptability to such extent that it is now applicable to all forms of teeth. Two of the modified forms of this attachment which are perhaps most generally used are given here: the Lingual Hood attachment (Fig. 3-C), used in making attachment to the anterior teeth, and the Half and Three-Quarter Cast Gold Jacket Crown (Fig. 3-E-F), used upon the posterior teeth. The technique of their construction being practically the same, the following brief description will serve for both. The tooth is prepared with a gingival shoulder, much in the same manner as it would be for a porcelain jacket crown, the only material difference being that the labial or buccal enamel surface is left standing and a groove made in the mesial occlusal and distal surfaces to engage the metal rib, which in this form is a part of the metal structure, taking the place of the wire staple in the original form. The direction of the grooves on the mesial and distal surfaces should be in line with the labial or buccal enamel plate, as in Fig. 3-G, instead of with the long axis of the tooth, as in Fig. 3-D.

The reason for this is that by the grove converging incisally or occlusally slightly toward the center of the tooth, as in Fig. 3-G, it serves to give the preparation a somewhat conical form, which permits the wax pattern to be withdrawn without distortion, and the complete attachment to go to place without binding.

The metal construction is made either by the direct method in which the wax pattern is formed directly upon the tooth or by the use of the pure gold or platinum matrix.

The following method used by Dr. A. E. Schneider of Chicago is given here because it is comparatively simple and will be found adequate to meet all the requirements necessary to a perfect adaptation.

First, a modeling compound impression is taken, using a thimble-shaped cap as for a porcelain jacket crown.

Second, from the impression an amalgam or cement die is developed.

Third, a wax pattern is formed upon the tooth and the bite ascertained by the patient pressing the opposing teeth into the wax.

Fourth, after approximately forming the wax pattern upon the tooth it is removed and placed upon the die, where it is carved and adapted to the gingival shoulder. After proving by replacing upon the tooth it is removed and the inner surfaces above the shoulder gone over with a Roach wax carver to diminish the bulk of metal where it would be unnecessarily heavy. The wax pattern is then invested and cast. After the attachment is cast it is returned to the die, placed in a swager having a soft rubber plunger and firmly driven to place. It is then finished and polished, after which it is ready to be cemented to place upon the tooth.

THE CAST GOLD INLAY.

Attachment.

The possibilities of the cast gold inlay as an attachment to vital teeth in retaining fixed bridges, or, when used in conjunction with other attachment devices, the retention of removable partial denture construction are so numerous that to go into the subject to any extent would require more time and space than could possibly be given in a paper of this description.

Briefly, it may be said, that the mesio-occlusal, disto-occlusal and M. O. D. forms are most generally used for attachment purposes, the latter being the strongest and most reliable. The mesio-occlusal and disto-occlusal forms, when used in fixed bridge work, as in Chart 12, Fig. 1-A, are usually unreliable, unless the inlay at one end of the bridge is semi-attached by the use of some such means as a stud and groove, as in Fig 1-B. When both are rigidly attached, as in Fig. 1-A, the force of mastication will sooner or later unseat the inlay at one or the other end of the bridge. When used in conjunction with other attachment devices, as in Fig. 2-A, they are more reliable because the stress upon them is greatly relieved by the movable connecting joint between the inlay and the bridge or denture.

In removable bridge work or partial denture construction the M. O. D. form is of great importance as a means whereby the various commercial attachments can be applied to vital teeth. This form is given preference here because it has the inherent strength and stability of attachmnt to the anchorage tooth which is necessary for this purpose. While other forms can, in certain cases, be used with success they are not, as a rule, reliable and should be sparingly employed as fixed and rigid attachments.

THE STUD ATTACHMENT.

This form of attachment is fully described by Dr. Cummer of Toronto, Canada, from whose writings the following brief description is taken.

"The attachment consists of a projection or lug which engages in a recess in an inlay, crown or bridge." (As in Fig. 3-A.) The portion of the stud which projects into the recess is formed in the shape of an inverted cone, the base of which is at the terminal end. This formation is necessary to permit of its being tilted out of the recess when the denture is removed without binding and dislodging the inlay.

THE RING AND STUD.

This is simply another form of the same device, in which the application of the stud and recess is reversed, the stud being attached to the anchorage tooth and engaging in a metal ring attached to the denture, as in Fig. 3-B.

THE DOUBLE STUD.

In this form the studs are diametrically opposed to each other across the arch, the appliance or denture springing in and out of position over the studs. The single stud form of this device is the most useful, being particularly adaptable to cases where there is a loss of teeth on one side of the arch only, as in Fig. 3.

This completes the list of devices and methods employed in making attachment to vital teeth selected for consideration in this review, and while, perhaps, some forms have been omitted which should have been mentioned, I believe it practically covers the field.

Mention of the more complicated devices, such as are constructed by the ultra skilled specialist in this field, have been omitted, partly because their consideration would require too much time and space and partly because their construction requires greater technical skill than that possessed by the general practitioner, unless he has acquired exceptional skill by special preparation.

In closing I wish to call attention to another phase of this subject, which is of utmost importance, namely: the principles set forth by Dr. Peeso in regard to obtaining adequate saddle support in order to relieve stress upon the abutment teeth.

A relation must be obtained between the saddle and abutments at such a time when the saddle is riding firmly upon the ridge (or mucosa) that when the saddle is connected to the abutments the mucosa will help to bear the stress of mastication. This principle should always be applied as far as it is possible to do so in both fixed and removable construction.

I also wish to pay a tribute of appreciation to the splendid work of both Dr. Peeso of Philadelphia and Dr. Chayes of New York, which is doing so much to place partial denture construction upon a sound scientific basis.

DENTISTRY IN OUR STATE INSTITUTIONS.*

BY DR. A. B. CULHANE, ROCKFORD, ILL.

Mr. President and Members of the Illinois State Dental Society:

About four years ago I was appointed a member of the Illinois State Civil Service Commission, and during this time it has been a duty, as well as a privilege, to observe the work being done by the various employees in the service of the state.

There are twenty-three large state institutions located in different parts of Illinois. Twenty of these are known as charitable institutions, two of them are prisons and one a reformatory.

We have seven state hospitals for the insane, having approximately 20,000 patients. It is the dental service being rendered to those patients, to which I particularly desire to direct your attention.

In the seventh biennial report of the Illinois General Hospital for the Insane, at Peoria, June 30, 1908, I find this report on Institutional Dentist:

"In no departure has greater good been done our patients than in the creation of the position of dentist. To think that these inmates had been allowed to exist from one to forty years without the services of a dentist other than the occasional extraction of a tooth by an assistant physician seems incredible. We were singularly fortunate in securing in Dr. Walter J. Weatherwax a man who rose to the occasion and grasped the problem in its broadest meaning."

I will now read the report of Dr. Weatherwax, written ten years ago:

"REPORT OF THE INSTITUTIONAL DENTIST.

To George A. Zeller, M. D., Superintendent Illinois General Hospital for the Insane.

Sir:—In submitting my report of the first year's work as Odontologist of your institution, I think it most important that I should make mention of some general observations and suggest remedies.

The important part played by the teeth in the mastication of food, and hence the nourishment of the body, is recognized by all. It is also well known that micro-organisms which are developed in the decomposition of food particles and other organic substances do not become destroyed upon entrance to the stomach. Septic conditions in the mouth favor infection of the alimentary tract, thereby lowering the vitality and power of resistance. This being an acknowledged fact, is it not true, then, that the patients who are detained in an insane asylum, practically all of whom are utterly incapable of caring for their teeth, should have the best and most painstaking services of an odontologist.

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*Read before the Illinois State Dental Society, May, 1917.

This institution, already widely and most favorably known for its radical innovations for the handling and treatment of the insane, has, in my opinion, added no feature of greater importance nor one whose work has greater or more far reaching results than are shown in the odontological department.

During the short time which I have been engaged in the work I have examined the mouths of approximately all of the patients at your institution, and I must say that I have found them in the most horrible condition imaginable. I sometimes wonder how patients with mouths in the condition in which I find many of them, can possibly live, not to say have good health. Many of them have had absolutely no attention for fifteen or twenty years, and are in a condition that beggars description. Many mouths are a mass of decayed teeth and roots, the remaining good teeth, if any, entirely covered with deposits of tartar, the roots surrounded with badly inflamed gums, with pus exuding constantly from pockets. The odor coming from such mouths is so foul that it is almost impossible to stand over the patient long enough to extract the roots and teeth that are beyond repair. The condition of the atmosphere of the operating room, after a half day's work, is such as to require the services of the fumigating force of the health department.

It is not my intention to criticize your institution nor its management, but in my opinion one of the greatest, if not the greatest, obstacle to the improvement in the general health of your patients has been the neglect in the care of the teeth. You have spent much time, study and money in the preparation of the purest, most wholesome and nutritious food for the patients, with what result? To be sent upon its excursion down the alimentary tract laden with all forms of infectious matter taken up in its passage through the oral cavity. The relieving of this condition is not an easy task, much less a pleasant one.

My work up to the present time has consisted in the removal of roots and teeth that are beyond repair and the scaling of deposits from the remaining teeth. This work is handicapped somewhat by the salary allowed for such services.

No odontologist whose services would be acceptable (and none other should be employed, lest he do more harm than good) can give up his time at the present fee. The work at any price is one of charity; that is, a person to carry it on properly must be interested in it aside from the pecuniary consideration and have, for his primary object, the greatest good for his unfortunate patients.

I find the most of them submit to the operation willingly and seem to appreciate the efforts being made to relieve their suffering. As a rule they are not as responsive to pain as the average sane person.

It is my intention, if permitted to continue in the work, to defer the filling and treating of the teeth worth saving until after I have placed all the mouths in a reasonable condition of prophylaxis and have removed the causes of all acute conditions."

I have been very much impressed with this most remarkable report concerning conditions in our state hospitals a decade ago.

It is my understanding that dentists were appointed to places in the Hospital Service after this society had studied conditions in our state hospitals and were convinced that the insane wards of the state were not receiving the necessary dental service for the conservation of their health.

The Illinois State Dental Society has exerted a wonderful influence for good in this great state of ours, and gentlemen, I wish to say that when you used your influence to convince our state officials that these poor people over whom a mental cloud had settled, were being neglected, you builded better than you knew, for with the possible exception of the state of New York, Illinois now leads in the number of dentists employed in state hospitals.

I have corresponded with the Governors of a number of different states, seeking information regarding the employment of dentists in state institutions, and it might be of interest to you to know what they are doing along this line.

This letter I received from the Ohio Board of Administration:

"In reply to your inquiry of the 22nd inst. would say that this state has no fixed policy in reference to the employment of dentists. Most institutions secure the services of local dentists for such time as may be needed—a half day or more per week.

"This scheme has been in effect for many years and seems to give reasonable satisfaction.—Signed, The Ohio Board of Administration."

Now, the unfortunate inmates of a state hospital in Ohio are not any different from those in Illinois, and I would suggest, and in a most kindly spirit, that there be a joint meeting of the Ohio State Dental Society and the Ohio Board of Administratoin, let the report of Dr. Weatherwax be read, and I feel certain that this scheme of theirs which they say has been in effect many years and given satisfaction, would be discarded at once and the wards of that state be given the dental service to which they are entitled.

In a letter received from the Secretary of the State Board of Control of Wisconsin, he writes:

"This state does not employ any dentists to do dental work at the institutions. The local dentists in the towns in which the institutions are located do the dental work in the institutions, but the state does not employ dentists nor contribute anything toward the dental work for any of the inmates of state institutions.

"At the State Hospital at Mendota and the Northern Hospital at Winnebago, a dentist goes to the institution once a week and does such dental work as is found necessary. If the inmate has money with which to pay for the dental work he pays it, and if he has no money the bill for the dental work is sent to his relatives. We have endeavored at times to get legislative action authorizing the managements of state institutions to employ dentists to do work for indigent persons, but thus far we have not been able to get any legislation giving such authority. Signed—State Board of Control of Wisconsin."

May I suggest to the Wisconsin State Dental Society that here is a fertile field for action.

The Secretary of the State Board of Charities and Corrections of the State of Missouri writes: "There are three state institutions in which a resident dentist devotes full time to caring for dental work of inmates. These are the penitentiary and two hospitals for the insane. Four institutions employ dentists from one-fourth to one-half time, and others only occasionally.

"All dental work in state institutions is done without charge to patients except in cases where financial circumstances of relatives and guardians enable them to defray such expenses without serious inconvenience."

While the situation regarding the dental service in the state institutions in Illinois is far better than in other states, I feel quite certain that it is not as it should be.

At the present time the dentists at Elgin, Jacksonville and Peoria are working only part time. There is enough work to be done at each of these hospitals to engage the whole time of at least two dentists.

In visiting one of our state hospitals I am impressed with the spirit of co-operation existing between the superintendent and the physicians comprising his staff and I would like to have the dentist made a part of the hospital unit instead of being placed in the isolated position that he occupies today.

Some time ago the alienist of the State Board of Administration placed before me the monthly report of the dentist at one of our state institutions where the ages of the inmates would approximate from nine to fifteen years. He said, "Here is a fine report; what have you to say about this?"

The report showed that the dentist had extracted something like 65 or 70 permanent teeth, and had placed root fillings in about a dozen teeth.

The alienist of the State Board of Administration is without doubt a capable physician and alienist, but he is not capable of properly interpreting the report of a dentist, nor of directing his work.

I have given this subject some thought and study, and I am going to make a few suggestions which I believe if placed into practical application would be the means of supplying the wards of the state with more adequate dental service.

There should be a State Dental Surgeon having supervision over all dentists employed in state institutions. He should devote his entire time to the state, making regular visits to all institutions where dentists are employed.

I believe it would be wise as well as economical to have two dentists in every insane hospital where we now have one. The function of a state hospital is to restore a patient to normal mental condition at the earliest possible moment.

Now, accepting the teaching of Billings, Moorehead, Mayos and Rosenow concerning oral infections and systemic diseases, dental services in state institutions should be increased, not diminished.

I would suggest that the State Society investigate dental conditions in state institutions, then make their recommendations to the proper authorities, and I believe the wards of the state would then receive the dental service that they should receive, and to which they are justly entitled.

TECHNIQUE OF PULP CANAL SURGERY.*

BY DR. ELMER S. BEST, MINNEAPOLIS, MINN.

Mr. President, Members of the St. Louis Dental Society, Dr. Johnson, Ladies and Gentlemen: I must confess that on this occasion, as on another occasion when I visited St. Louis, I have experienced considerable embarrassment. I thought that I knew what I was going to say in opening this paper, but on listening to my good friend and counselor, Dr. Johnson, I am free to confess that many of the things I had in mind to say to you have entirely gone.

Last Spring, when I was here, I showed you several charts, the contents of which I had worked on for many months. The next morning, when I was in Dr. Conrad's office, he took down a volume of bound dental journals—I think it was the *Archives of Dentistry* of about 1875—where some one had read a paper in which he presented almost the same material that I was presenting here, and that was original, I thought. From there I went to Dr. Loeb's office, and I had not been there a minute when he said: "I want to show you something that I think is very interesting. It is something that I have just arranged." And then he showed me a system for the arrangement of radiographs that I had spent nearly a year on, and he had devised it and already published it, although I had not seen it.

So it is today, and I am going to take the privilege of dwelling this morning on some of the things that have already been brought up, because Dr. Johnson's paper and mine are so closely related.

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*Read before the Sixtieth Anniversary Meeting of the St. Louis Dental Society, November, 1916.

I want you to remember one thing that Dr. Johnson said, and that is "It is so difficult for us to see anything in the human mouth excepting that little cavity." And that answers the question of my good friend down here when he tells us that the physician will send a radiograph to him and demand the extraction of certain teeth —why? Because many of the physicians know that if infected teeth—and by this I mean unquestionably infected teeth—are removed those patients generally benefit. So those men will send patients that they suspect of having such conditions in their mouths to a dentist for a report on the condition of the mouth, and what do they get? What I mentioned here last spring. The dentist will so often send back a report of, "I see no cavities. I see no pyorrhea; this patient, so far as his teeth and jaws are concerned, is in healthy condition." That is largely the reason why physicians will send radiographs to the dentist and say, "Extract these teeth."

I have analyzed that subject carefully, and what I have said is my honest opinion. I may be wrong, but I do not think so. You have to convince the physician that you know whereof you speak.

Now we have the medical profession with us, if we can only show them that we are taking a co-operative instead of an antagonistic view, but we will never get anywhere as long as we stand on one side of the fence and the physician is on the other, and take up all of our time and his time arguing this point. They are only too willing to send those cases, as far as my experience goes, to a dentist to have an interpretation of the conditions, not only of the teeth, but of the jaws. In answer to the question that was brought up as to who should make this examination, the physician or the dentist, I say most emphatically, the dentist; because the proper interpretation of the condition of those jaws cannot be made by the X-ray man alone, but it must be arrived at by the most careful clinical examination, and therefore, the only proper report on the condition of the teeth and jaws is a report made by the dentist, who understands what is normal. That is where the great trouble is. Some inexperienced men do not understand and do not recognize the normal. As Dr. Johnson said, they were calling the floor of the antrum "lines of infection."

But if they know that we are willing to take a case—though some of those root canal tooth fillings may be yours and some of them mine—if they know we are willing to take a case and say, "We may have made a mistake, but we are trying hard to profit by mistakes and not make them again," and if a tooth is surrounded by diseased conditions, be willing to say that it is, then, I believe, they will be willing to concede to us our proper place in the matter.

With regard to seeing abscesses in radiographs, that is impossible. I say that with all emphasis: It is impossible. An abscess is what? A cavity containing pus, and all that you see in the radiograph is a variation in shadows, a record of varying densities, thick in some places, thin in others; and you cannot tell, and nobody else can tell by looking at the radiograph whether or not that area of lessened density contains pus or whether it may be a granuloma, a cyst, or a cavity where infection occurred at one time and where no infection exists at the present time. We have proven that some of these cases do not contain infection of any kind, although some of these nonpurulent cases will be just as dangerous as those where we have a great collection of pus. Particularly in the lower bicuspid and molar regions you will find areas of lessened density close to the apices of those teeth. That is many times a normal condition. The mental foramen will quite frequently appear at the lower first or second bicuspid, generally the second, and I have repeatedly seen the diagnosis of physicians. "Extract the lower bicuspid," when it was later proved that the abscess they thought present was the mental foramen; they were not familiar with what constitutes a normal condition.

Having decided that it is necessary for the dentist to be able to make intelligent and thorough diagnoses of the conditions in the jaws of his patients, I will outline for your consideration some of the different methods employed in making different examinations:

In figures Ia and Ib we have the plates of each jaw carrying the areas as far as the cuspid regions. This method, which was extensively employed by the late Dr. Eisen of Milwaukee, is one of the best methods we have at our disposal. The thoroughness of such an examination and the rapidity with which it can be made justifies us in using it very extensively. Where we are able to examine the jaw conditions surrounding the teeth as far forward as the cuspid, a couple of No. 2 Eastman films for the upper and

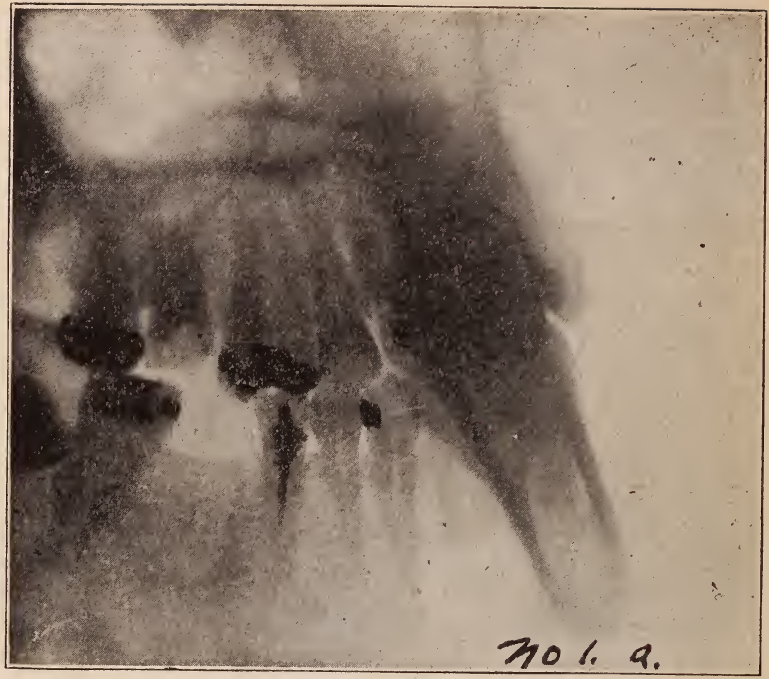

Fig. 1 A.

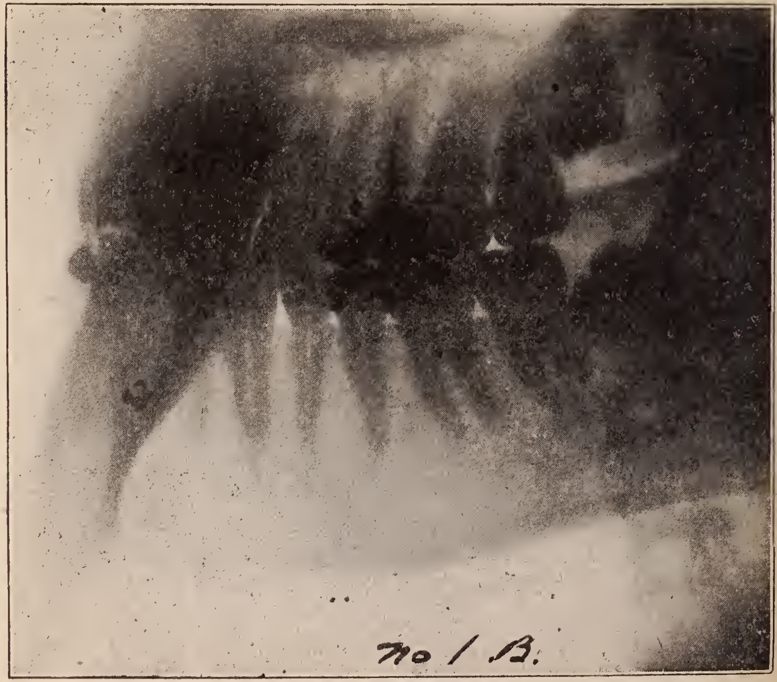

Fig. 1 B.

lower anterior will complete the examination. The advantage of this method is that we will find conditions in the jaws somewhat removed from the teeth under investigation, but which, nevertheless, have an important bearing on the patient's condition. In addition to this important point, we have the added advantage of being able to make the examination in a comparatively short space of time.

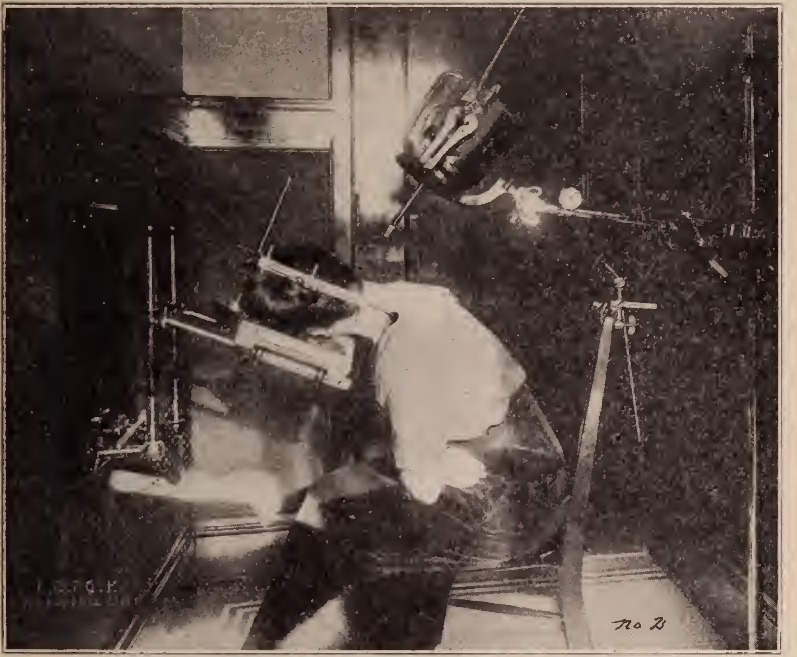

Fig. II.

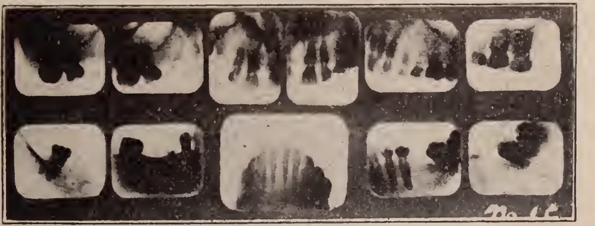

Fig. 1 C.

In figure II is shown the relative position of the patient's head and the tube.

In figure Ic we have the system which is somewhat similar to that employed and described by Dr. Loeb of St. Louis and Dr. Lucas of Indianapolis. In the employment of this plan the field under investigation is first divided into upper and lower, and the upper into six areas and lower into five. A film designating upper right three always includes the area of the three molars. Upper right two give us the bicuspids and cuspid. Upper right one the central and lateral. A similar arrangement is used on the left side and in the lower with the exception that for the lower four anteriors a large or No. 2 film is used.

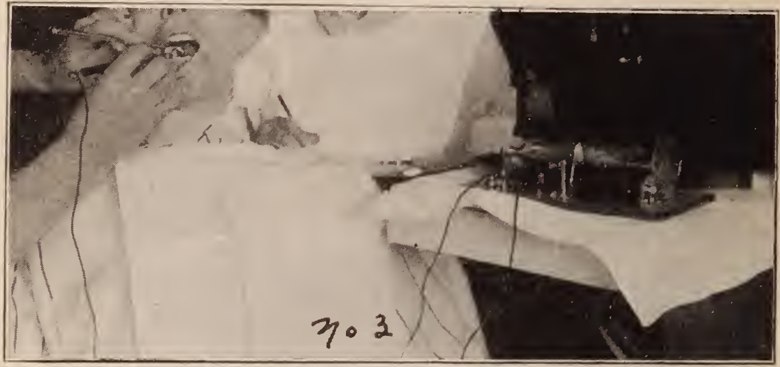

Fig. 3.

Having also decided that an X-Ray examination of the teeth and jaws is incomplete unless we have a record of the vitality of the various teeth, in figure 3 is shown a method employed in testing the various teeth. This is a small battery having a double and cone socket instrument, one end receiving the cord from the battery, the other containing an instrument which is placed on the teeth in making the test. The negative pole is held in the patient's hand. In making these tests it is important that the instrument does not come in contact with any metal in the tooth. It is also well to observe that in making examinations of molars and bicuspids a response is more readily obtained in the fissures than on the buccal or lingual surfaces. Similarly, in the anterior region the incisal edge generally gives a quicker response than any other surface. This latter condition probably is due to the fact that the enamel on the anterior teeth is somewhat worn on the incisal edges.

The explanation of the chart as shown in figure 4 would be as follows:

Upper right third molar is in normal condition. Upper right second molar has a diseased pulp. The plus sign indicates its vitality, and the minus sign indicates its non-vitality.

The first molar is a pulpless tooth, and has an an imperfect root canal operation with a necrotic area over the mesial buccal root. The second bicuspid having a line surrounding the root and crown is so loose that it would have to be extracted. It is, however, a vital tooth. The first bicuspid is also vital and in normal condition. The cuspid has a pyorrhea pocket on both the lingual and labial surfaces, but is otherwise in normal condition. The lateral is a pulpless tooth with a diseased area surrounding the apex. The

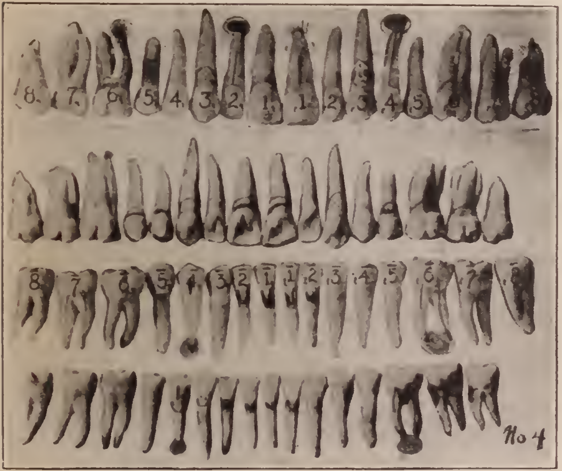

Fig. 4.

Fig. 5.

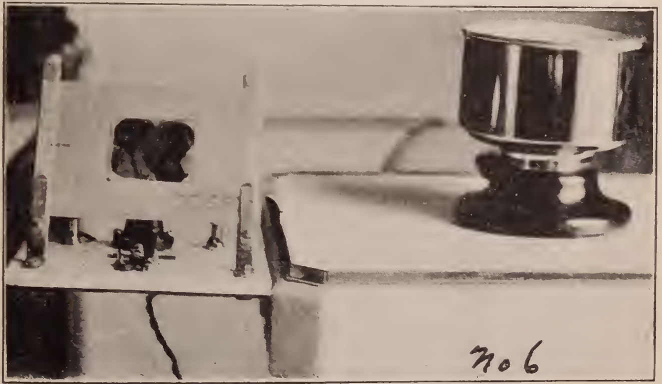

Fig. 6.

central is vital and in normal condition. The left central is pulpless with a very small area in the apex and it has been decided from radiograph that this condition will be handled by ionization and it will not be necessary to curette. The lateral is vital and in normal condition. The cuspid has a pyorrhea pocket on the labial and lin-

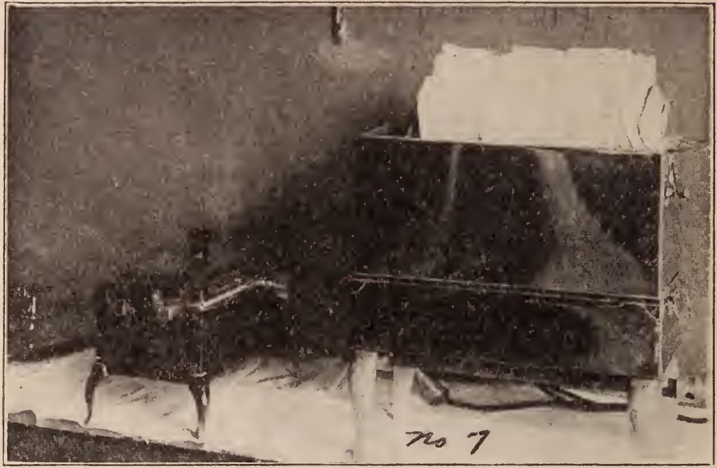

Fig. 7.

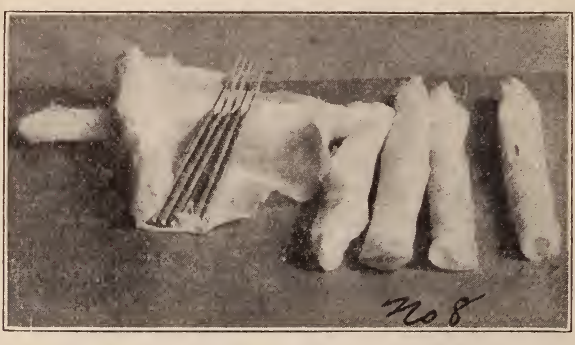

Fig. 8.

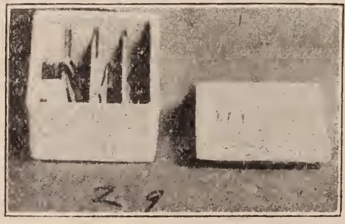

Fig. 9.

gual surfaces. The first bicuspid is pulpless with a necrotic area. The second bicuspid is normal. The first molar has a pyorrhea

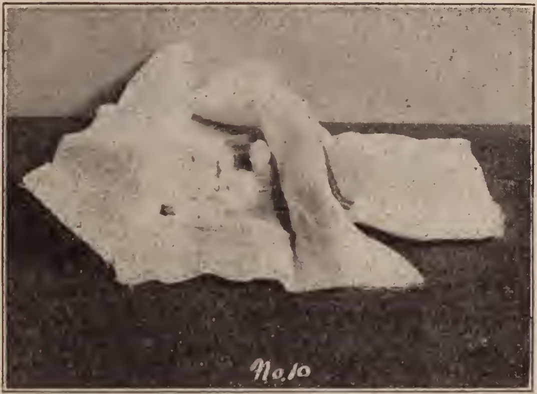

Fig. 10.

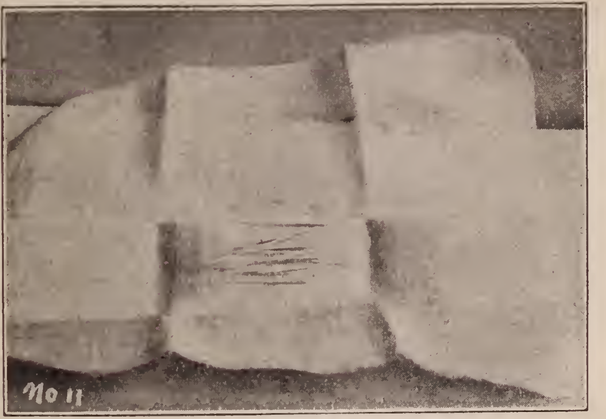

Fig. 11.

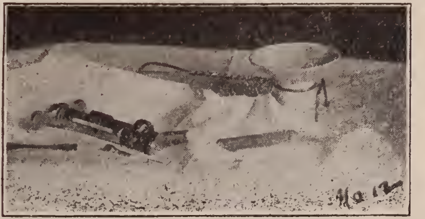

Fig. 12.

pocket on the buccal and lingual surfaces, but is vital. The second molar is in a normal condition except for the small pyorrhea pocket on lingual surface. The third molar is so loose that it must be extracted. Similar conditions are found in the lower teeth.

Figure No. 5 shows the method of handling the rubber dam. It is kept immersed in a 60 per cent solution of alcohol.

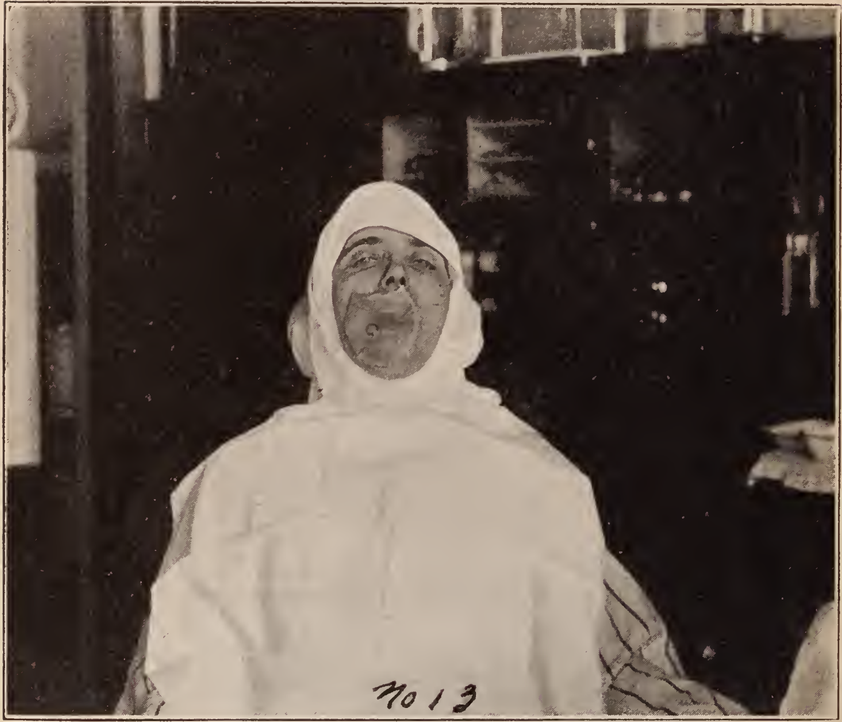

Fig. 13.

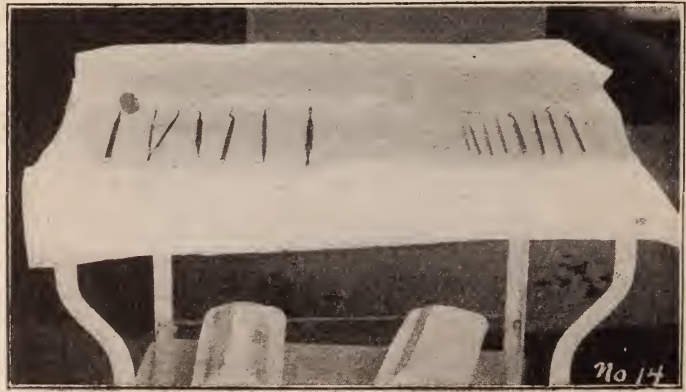

Fig. 14.

In figure No. 6 we have an electric bur and broach sterilizer.

In figure No. 7 is shown a Wilmott Castle steam sterilizer for sterilizing dressings and gauze.

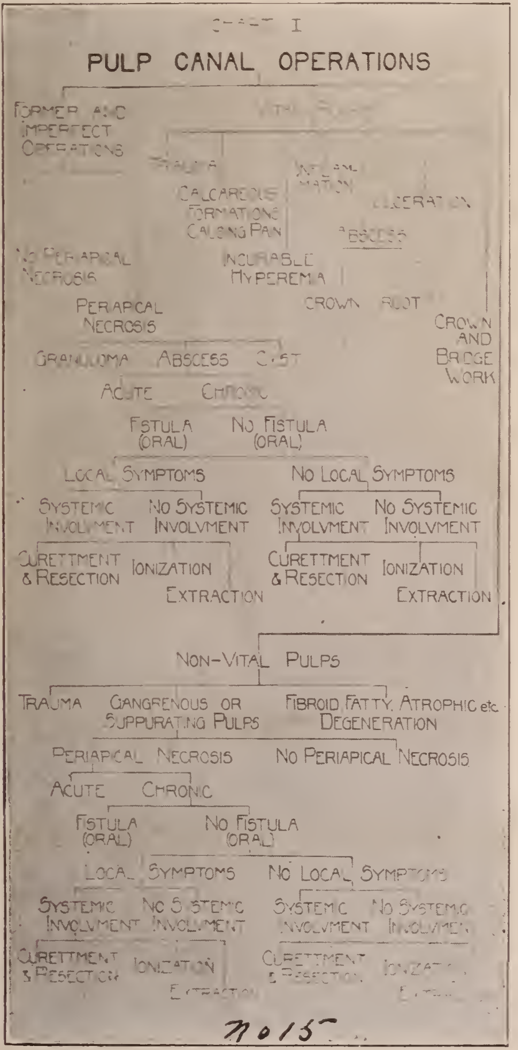

Fig. 15.

Figure No. 8 shows the dressing bristles. These bristles are wrapped with cotton and sterilized before being placed in canals.

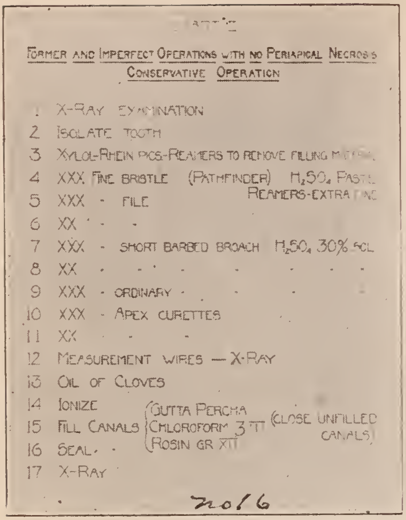

CHART II

FORMER AND IMPERFECT OPERATIONS WITH NO PERIAPICAL NECROSIS
CONSERVATIVE OPERATION

1 X-RAY EXAMINATION
2 ISOLATE TOOTH
3 XYLOL-RHEIN PICS-REAMERS TO REMOVE FILLING MATERIAL
4 XXX FINE BRISTLE (PATHFINDER) H_2SO_4 PASTE
REAMERS-EXTRA FINE
5 XXX - FILE
6 XX - -
7 XXX - SHORT BARBED BROACH H_2SO_4 30% SOL
8 XX - - - - - - -
9 XXX - ORDINARY - - -
10 XXX - APEX CURETTES
11 XX - -
12 MEASUREMENT WIRES — X-RAY
13 OIL OF CLOVES
14 IONIZE
15 FILL CANALS {GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII} (CLOSE UNFILLED CANALS)
16 SEAL - -
17 X-RAY

no 16

Fig. 16.

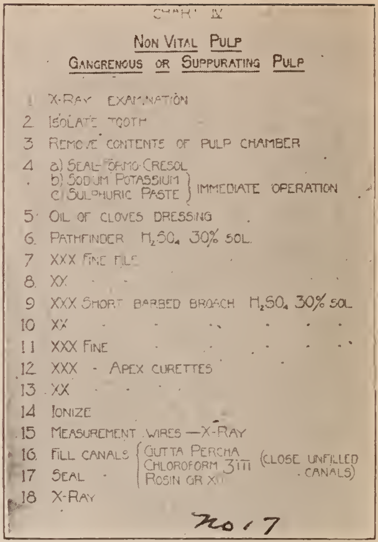

CHART IV

NON VITAL PULP
GANGRENOUS OR SUPPURATING PULP

1 X-RAY EXAMINATION
2 ISOLATE TOOTH
3 REMOVE CONTENTS OF PULP CHAMBER
4 a) SEAL-FORMO-CRESOL
b) SODIUM POTASSIUM } IMMEDIATE OPERATION
c) SULPHURIC PASTE
5 OIL OF CLOVES DRESSING
6 PATHFINDER H_2SO_4 30% SOL.
7 XXX FINE FILE
8 XX - -
9 XXX SHORT BARBED BROACH H_2SO_4 30% SOL
10 XX - - - - - -
11 XXX FINE - - - - -
12 XXX - APEX CURETTES
13 XX - - -
14 IONIZE
15 MEASUREMENT WIRES —X-RAY
16 FILL CANALS {GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII} (CLOSE UNFILLED CANALS)
17 SEAL -
18 X-RAY

no 17

Fig. 17.

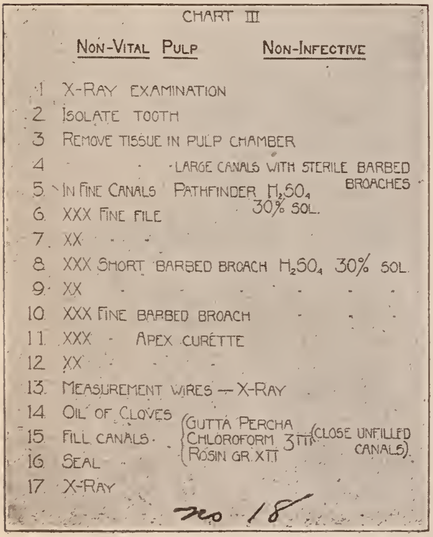

CHART III

NON-VITAL PULP NON-INFECTIVE

1 X-RAY EXAMINATION
2 ISOLATE TOOTH
3 REMOVE TISSUE IN PULP CHAMBER
4 - - LARGE CANALS WITH STERILE BARBED BROACHES
5 IN FINE CANALS PATHFINDER H_2SO_4 30% SOL.
6 XXX FINE FILE
7 XX - - -
8 XXX SHORT BARBED BROACH H_2SO_4 30% SOL.
9 XX - - - - - -
10 XXX FINE BARBED BROACH - - -
11 XXX - APEX CURETTE
12 XX - - -
13 MEASUREMENT WIRES — X-RAY
14 OIL OF CLOVES
15 FILL CANALS {GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII} (CLOSE UNFILLED CANALS)
16 SEAL -
17 X-RAY

no 18

Fig. 18.

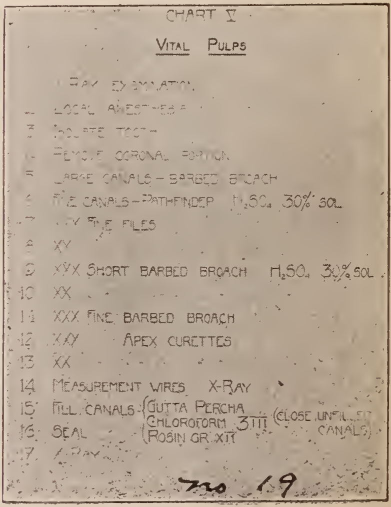

CHART V

VITAL PULPS

1 X-RAY EXAMINATION
2 LOCAL ANESTHESIA
3 ISOLATE TOOTH
4 REMOVE CORONAL PORTION
5 LARGE CANALS – BARBED BROACH
6 FINE CANALS – PATHFINDER H_2SO_4 30% SOL
7 XXX FINE FILES
8 XX
9 XXX SHORT BARBED BROACH H_2SO_4 30% SOL
10 XX - - -
11 XXX FINE BARBED BROACH
12 XXX APEX CURETTES
13 XX - - -
14 MEASUREMENT WIRES X-RAY
15 FILL CANALS {GUTTA PERCHA, CHLOROFORM ʒiii, ROSIN GR XII} (CLOSE UNFILLED CANALS)
16 SEAL -
17 X-RAY

no 19

Fig. 19.

Figure No. 9 shows the gutta percha points which are kept in alcohol.

Figure No. 10 shows the Richmond Cotton Pellets for wiping out cavities.

Figure No. 11 shows a similar method for the handling of Johnson's paper canal points.

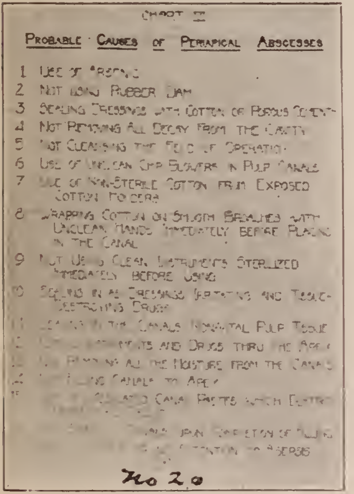

Chart [illegible]

Probable Causes of Periapical Abscesses

1 Use of Arsenic
2 Not using Rubber Dam
3 Sealing Dressings with Cotton or Porous Cement
4 Not Removing All Decay From the Cavity
5 Not Cleansing the Field of Operation
6 Use of Unclean Chip Blowers in Pulp Canals
7 Use of Non-Sterile Cotton from Exposed Cotton Holders
8 Wrapping Cotton on Smooth Broaches with Unclean Hands Immediately Before Placing in the Canal
9 Not Using Clean Instruments Sterilized Immediately Before Using
10 Sealing in as Dressings Irritating and Tissue-Destroying Drugs
11 Leaving in the Canals Non-vital Pulp Tissue
12 [illegible] Instruments and Drugs thru the Apex
13 Not Removing All the Moisture from the Canals
14 Not Filling Canals to Apex
15 [illegible] Canal Points which [illegible]
[illegible] upon Completion of Filling
[illegible] Attention to Asepsis

No 20

Fig. 20.

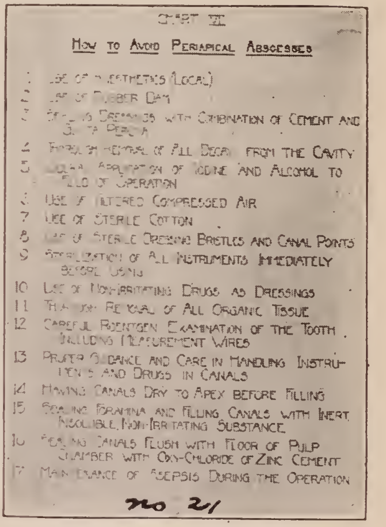

Chart [illegible]

How to Avoid Periapical Abscesses

1 Use of Anesthetics (Local)
2 Use of Rubber Dam
3 Sealing Dressings with Combination of Cement and Gutta Percha
4 Thorough Removal of All Decay from the Cavity
5 Thorough Application of Iodine and Alcohol to Field of Operation
6 Use of Filtered Compressed Air
7 Use of Sterile Cotton
8 Use of Sterile Dressing Bristles and Canal Points
9 Sterilization of All Instruments Immediately Before Using
10 Use of Non-Irritating Drugs as Dressings
11 Thorough Removal of All Organic Tissue
12 Careful Roentgen Examination of the Tooth Including Measurement Wires
13 Proper Guidance and Care in Handling Instruments and Drugs in Canals
14 Having Canals Dry to Apex before Filling
15 Sealing Foramina and Filling Canals with Inert, Insoluble, Non-Irritating Substance
16 Sealing Canals Flush with Floor of Pulp Chamber with Oxy-Chloride of Zinc Cement
17 Maintenance of Asepsis During the Operation

No 21

Fig. 21.

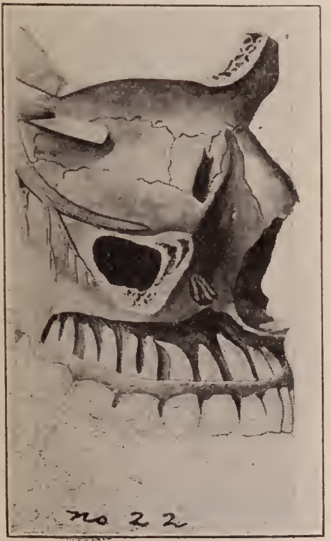

Fig. 22.

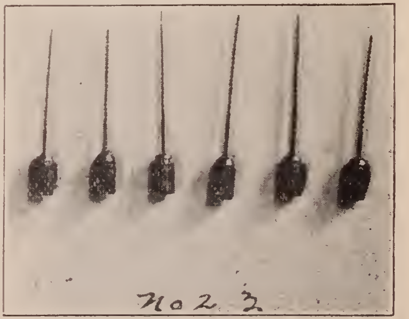

Fig. 23.

Figure No. 12 shows a Fischer syringe dissembled and boiled ready for use. We believe that this method is superior to that of keeping it immersed in alcohol and glycerine.

In Figure No. 13 is shown a Jiffy Rubber dam holder manu-

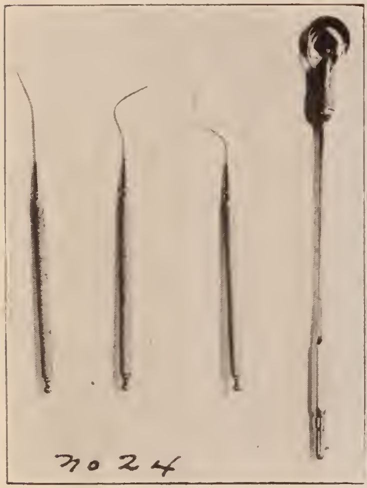

Fig. 24.

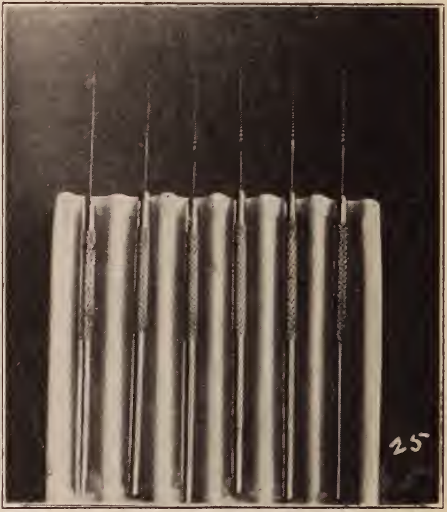

Fig. 25.

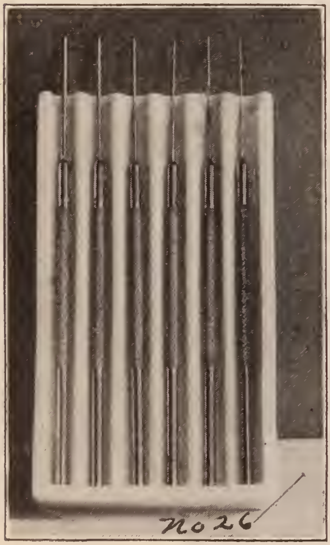

Fig. 26.

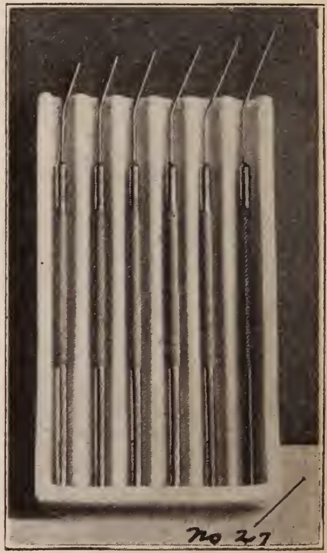

Fig. 27.

factured by the Lee-Smith Company and also the head wrap, which is employed for the purpose of limiting the unsterilizable field.

Figure No. 14 shows on the left side the instruments used up to the beginning of a root canal operation. On the right side are

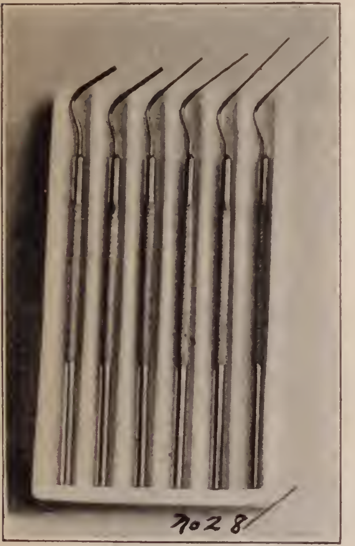

Fig. 28.

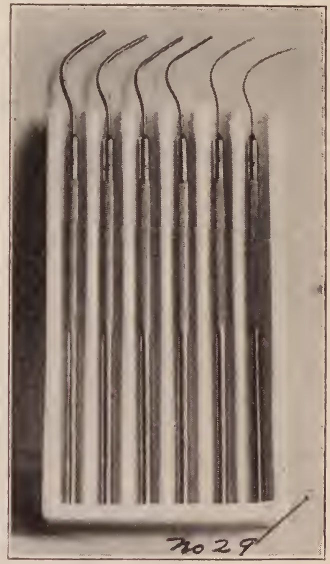

Fig. 29.

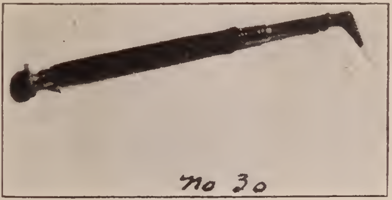

Fig. 30.

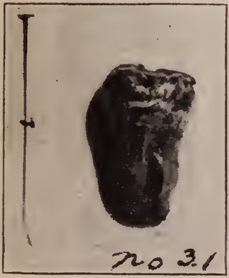

Fig. 31.

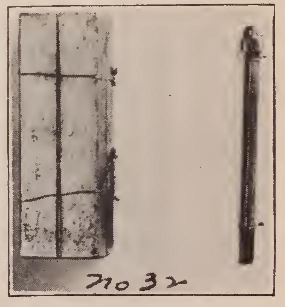

Fig. 32.

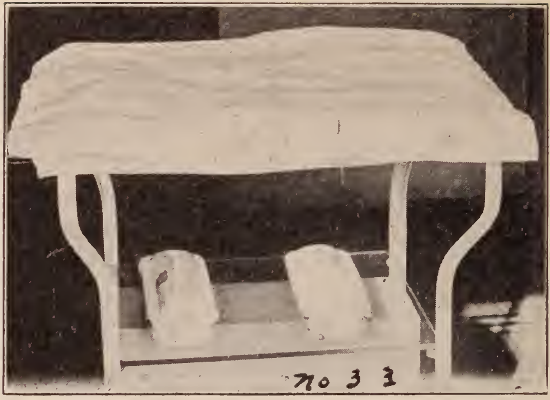

Fig. 33.

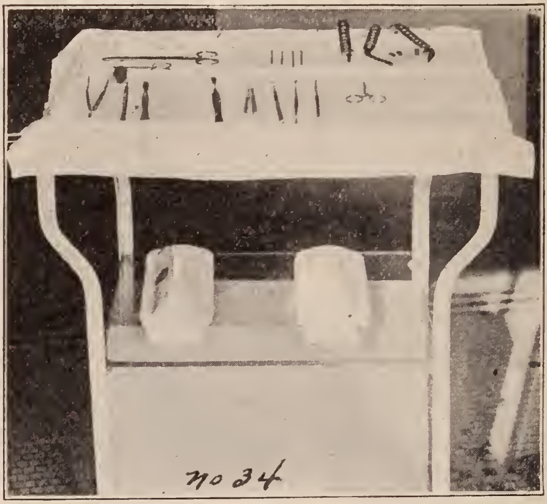

Fig. 34.

Fig. 35.

those actually used during the operation. These instruments must not be kept together.

Figure No. 15 shows the various conditions we find in connection with the different classes of pulp operations.

Figure No. 16 shows the procedure where a tooth has had a former imperfect canal operation, but which has no periapical necrosis.

In Figure No. 17 is shown the steps employed in the case of a non vital pulp which is gangerous or suppurating.

In Figure No. 18 we find the steps used where we find a non vital pulp which is not infected.

Figure No. 19 shows a procedure employed in removing a vital pulp.

Figure No. 20 shows some of the probable causes of infected pulpless teeth.

Figure 21 shows some of the ways to prevent the infection.

In Figure No. 22 is shown a necrotic condition over the cuspid and our duty is not fulfilled if we simply perform a root canal operation and leave such a condition in the patient's jaws. This area must be cleaned up.

Figure 23 shows the short handled Kerr file.

Figure No. 24, the Rhein pic and Dowling trans-illuminating lamp.

Figure No. 25 shows the long handled Kerr files in assorted sizes.

Figures Nos. 26, 27, 28 and 29 show the various shapes and sizes of instruments for condensing gutta percha in the canals.

In Figure No. 30 we have the right-angle broach holder suggested by Dr. Callahan.

In Figure No. 31 is shown the method employed in following a pulp canal in a curved root. It will be seen that the smooth broach is turned so that the point follows naturally the curve of the root instead of being forced into the outside wall of the canal as it would if it were perfectly straight while entering the canal.

In Figure No. 32 is shown the appliance used in constructing the small files made from smooth broaches.

In Figures Nos. 33, 34 and 35 are shown instruments and materials used in a root resection.

DOWEL PIN ANCHORED INLAYS FOR BRIDGE ABUTMENTS.*

BY ELLIOTT R. CARPENTER, D. D. S., CHICAGO, ILL.

Inasmuch as the journals have been working overtime publishing articles upon the subject of Removable Bridge-work, many of which are elaborately complicated and theoretical, the really practical and simply constructed ones are, I believe, far in the minority of the subject matter offered.

It is not my intention to debate the superiority of "Fixed" versus "Removable" Bridge-work, freely admitting at the outset that any fixture that can be removed for cleansing purposes is absolutely the ideal fixture from a sanitary point of view, but owing to the wear of attachment parts from the frequent removal and insertion of the fixture for said cleansing, and its movement up and down during the stress of mastication, the removal fixture often settles into the soft tissues unevenly, dragging one or more of the attachment teeth from their normal socket position, especially where a preventer lug is used at the proximo-occlusal angle, as in the partial lower lingual bar plate. As far as my own personal practice is concerned, I think I can safely state that at least 75 per cent of my patients demand a fixed or stationary bridge, as they seem to have a disturbed idea that anything that can be removed is at once false teeth, and that the same attached stationary is not.

Be that as it may, the avoidance of the wholesale slaughter of live and healthy pulps of teeth prepared for Inlay Bridge Abutments is the thing that interests us most, and as a flagrant offender along these lines in the past, it gives me great pleasure tonight to present to you a system of Inlay Bridge Abutments, whereby the normal pulps in the teeth back of the cuspids can be conserved.

Before opening the subject matter proper of my paper, I want to publicly express my gratitude to Dr. Walter Hine, who suggested to me this principle of Inlay Abutment Anchorage, and his generous consent to my development of its technique, and permission to present it to the profession.

First, the reason for adopting the cast gold inlay for Bridge Abutments was to avoid the unsightly show of an all gold crown abutment; secondly, and *most* important, was the overcoming of gingival inflammation so frequently present, and caused by the impinging of the crown band at the gingival border, it being possible to make a flush joint with a gold inlay, thereby reducing the area of contact with the gingival border by 60 to 75 per cent of length; hence, a sane mechanical procedure, overcoming, in many cases, the gingival inflammation referred to.

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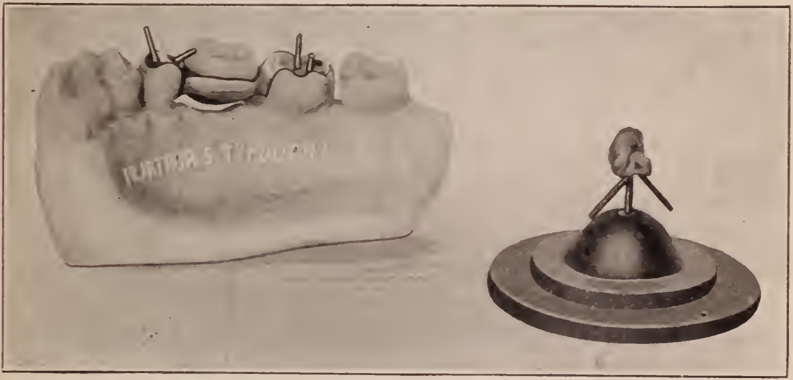
*Read before the Odontological Society of Chicago, May 1st, 1917.

So much has been intelligently written of the method of preparing cavities for compound proximal Inlays (and I here wish to emphasize that only inlays of the compound proximal shape should be used for Bridge Abutments) that I feel it necessary to add only one suggestion—that the occlusal dove-tail or lock be made fairly deep, thick mesio-distally, and wide linguo-buccally to permit of holding the ultimate dowel locking pins.



No. 1 No. 2

No. 1—Typodont shows sanitary porcelain top Molar Inlay Bridge with Inlay Anchorage pins in place. The pins have been left protruding from inlays to illustrate position of insertion.
No. 2—Taggart Crucible Former with Wax Inlay mounted on sprue showing graphite rods in place prior to investing.

The Inlay cavities being now prepared, we are ready for the impressions, which I would advise being taken with Taggart's Green Wax, because of its high fusing property, it does not distort upon removing from the cavity, and lends itself more readily by virtue of its hardness when cooled to accurate drilling for the dowel pins.

I find that for accuracy, saving of time and the rigid retention of the wax inlay against its margins while trimming it to form, a rigidly placed soft steel band matrix and holder is of great assistance, especially does it facilitate the drilling of true and accurate holes for the dowel locking pins by holding the wax inlay to its seat.

I have taken great pleasure in the use of the "New Ivory Matrix" retainer and soft steel bands, because it is applied buccally, allowing the teeth to occlude, thus obtaining the true articulation or bite by having the patient bite and chew into the warm wax after it has been driven into the cavity by the operator; now trimming away excess wax until proper occlusion and margins are obtained, we are ready to drill the holes for the reception of the ultimate dowel locking pins.

While it may seem a very simple procedure to drill holes in wax, it has required quite a little experimenting to procure the type of drill that would drill a perfectly true and clean-sided hole; this has led to the selection of a twist drill, No. 19, made by the Blue Island Specialty Company, and cut down by them for me to one-quarter inch length, as I found the one-half inch length of their stock drill apt to wabble, even in a perfectly new right angle engine hand piece.

Having selected the points in the wax inlays through which the holes are to be drilled, oil your drill point, hold your drill at an angle of about forty-five degrees, and under a blast of cold air, to keep your wax chilled and your field clean, drill gently through the wax until your drill point touches the hard dentin under the inlay, and withdraw your drill while still revolving, sinking one hole in a lingual direction and one toward the buccal for each inlay anchorage.

The matrix and retainer may now be removed and the remaining surfaces of the wax inlay trimmed and polished with a snip end of cotton roll armed with oil of cajuput.

The next step is to protect the drilled holes from the invasion of investment compound. Take the small size lead or graphite rods used for metal watch chain pencils, put up in brass containers, marked on the end "size R" and obtained from either the jewelers' or stationers' shops. Round slightly the square end of graphite rod to start in hole, break to a length that will allow the rod to stand a quarter of an inch out of the wax inlay after it has been pushed to the bottom of the hole.

The wax should now be sealed around the graphite rod by the application of a hot, small, round-pointed instrument, like a root canal plugger bent to an angle of forty-five degrees, at a point one-half inch from its point. This will be found a handy instrument for this purpose and will obviate the danger of injuring by heat your now finished wax inlay margins.

The graphite rods now securely sealed to seats, the wax inlays may be removed, invested and cast. The resultant inlays are now ready to trim and polish in the mouth until they settle to seat and proper margins, and the impressions taken for the future bridge. The bridge now completed and polished, the remaining graphite rods should be drilled out with the twist drill, and you are ready to try in the mouth. Upon settling the bridge firmly to seat, you correct occlusion, remove the bridge, dry and seal all the dowel holes with gutta percha points by hot instrument, and bridge is ready to set with cement.

At a subsequent sitting, remove gutta percha points and drill into dentin with twist drill to the depth of one-sixteenth of an inch beyond the dowel pin holes in inlays, and the case is now ready for dowel pin anchors. These pins are of round gold clasp metal wire and should be slightly rounded on ends entering the tooth structure.

Each dowel pin is now seated and cut off to a length to allow them to stand out of inlay one-sixteenth to one-eighth of an inch, as preferred. Removing pins from holes, place in sequence upon your operating bracket, that each pin may be returned to its measured hole when cemented to place (the holes varying in length), the pins are now cemented to place, and allowed to set hard before grinding off excess length, for which purpose I use a small carborundum wheel.

It is possible by chilling the bridge in cold water before setting, and using a slow setting cement, to use one mix and set the anchor pins at one sitting, but it is a dangerous procedure, especially during the hot months of summer, and I personally prefer the more conservative method of setting my bridge first, and the dowel pin anchors at a subsequent sitting, even though it makes for a lot of extra time and work.

I have laid especial stress upon correcting the occlusion of your bridge before setting in cement (and that applies as well to all single inlays), as vibration from a revolving abrasive stone will cause a faulty crystallization of your cement in its early stages of setting.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-THIRD ANNUAL MEETING.

Held at Quincy, May 8-11, 1917.

DISCUSSION ON THE PAPER OF DR. COLTRIN.

Dr. G. Walter Dittmar, Chicago:

Mr. President and Members of the Illinois State Dental Society: Before I enter into the discussion of the subject I wish to say that I am sure we all feel that Dr. Coltrin has given us a most excellent exposition of this subject. The immense amount of work involved in the production of these drawings I can well realize, and Dr. Coltrin did all this work himself. He organized his presentation in a very logical manner, starting as he did, and going through practically the whole subject. I think this society owes Dr. Coltrin a vote of thanks—he deserves it for the great amount of labor he put on this subject and the excellent manner in which he presented it.

Regarding the subject, there are but a few things I wish to discuss. The paper was so clear and comprehensive and the illustrations brought out the points so well that it will be a waste of time to discuss other than just a few points. First, the tenso-friction appliances, which act through tension produced by friction and thus retain the appliance or removable denture in position.

There are many forms of tenso-friction appliances, such as the illustrations show, and it is up to the dentist to use his judgment as to the kind he is going to use. There are many things to consider. First of all is the shape of the tooth. A certain type of clasp may work well on a certain type of tooth, whereas it would not work well on another type of tooth. A bicuspid may be shaped so that a certain form of wire clasp would not work well on it, whereas a modification of the wire clasp would work effectively. There is another thing which needs to be considered, and that is the position of the tooth in the mouth. For instance, if you clasp a third molar or a cuspid the retentive appliance that you make must be of a different type than if you had a bicuspid on either side.

There is another very important element that must be considered and that is dental pathology, viz.: whether the mouth is susceptible to caries or whether it is practically immune to carries. In a mouth that is highly susceptible to caries it would be folly to use a broad band clasp on a natural tooth, or it would be folly to use a modification of Dr. Roach's clasp, which covers a part of the surface of the tooth with platinum or gold, which closely fits the portion of the tooth to which the application is made, as indicated in Chart 6-B. If the mouth is very susceptible to caries, and the patient does not take good care of the mouth, remove the appliance every night and wash the teeth thoroughly, using all the necessary precautions, it would be folly to use an appliance of that kind. In the mouth of the average patient that form of clasp is suitable, although there is considerable surface contact.

The newer forms of clasps devised by Dr. Roach are possibly a modification of an older idea that Dr. Coltrin spoke of in his paper, but this new form of clasp as shown in Chart 6, Figures 1 and 2, and even Fig. 3, unquestionably have some advantages over any form of clasp that has been given to the profession up to this time, especially for teeth that have been so very hard to clasp properly, and that is, the cuspids. A clasp made in the form we have here, with, first, the swaging or burnishing of the lingual surface; second, the wire which runs up in the embrasure and over and comes down in the form of a hook, as indicated there, and, third, a piece of wire around the distal portion and the three parts united and reinforced with solder, make a clasp which will not have a tendency to impinge upon the tissues. It grips the tooth mesio-distally, and it is a clasp which is very rigid. It grasps the tooth well, so it will retain a denture on the upper as well as on the lower jaw. That modification of the band and wire clasp is much easier to make by making it in this sectional way, and it is a clasp with which you can get an accurate fit and a good grip on the tooth, but a perfect model or cast of the tooth to be clasped is necessary.

The appliance of Dr. Eldred looks as though it might be a pretty good form for making attachment to teeth. It is not really a clasp, and I question whether it would work well on the upper jaw, but on the lower jaw it might be indicated if you have a case in which such an attachment can be placed. As to the wire, there would be this danger as I see it: this long arm, or rather thin caliber wire, is likely to break because of accidental stress striking it in the mastication of food.

There is another point brought out in Dr. Coltrin's paper which I regard as very important, namely: if you desire to make an accurate fitting clasp, you must have a good impression. He has presented us with the three technics of taking an impression of a tooth to be clasped. The ones that appeal to me are those in Figures 2 and 3, Fig. 2 especially, where we have an individual tooth, as indicated here. That is a simple way of taking an impression and a simple way of making an accurate reproduction. The reproduction can be made in Melotte's metal, or it can be made in amalgam, but preferably in Melotte's metal, which can be poured directly into the impression. The other is the sectional method of taking impressions with modeling compound. Probably it was used in a certain way before, but Dr. Roach has perfected the technic so that an accurate impression of the buccal, lingual, mesial and distal can be procured, and that is an important thing if we desire to make a clasp which will grasp the tooth near the gingiva at the mesial or distal surface. A perfect impression is necessary. The old idea of taking a piece of clasp metal and a pair of pliers and bending it in a few minutes to make a clasp is wrong. It will be a misfit in the great majority of cases and, as a rule, will not do what is expected of it.

Another essential in clasp formation, in my opinion, is that clasps should always be constructed to remain on the teeth in the position that we place them. There is settling of the denture, and if we do not in some way provide so that it will not settle on the tooth, it loses its function as a clasp very soon, and it is likely to produce irritation to the gingival tissues. As a rule, we do not make clasps to take a position as high as this, although this particular form as indicated in A and C of Chart 8, Fig. 2, is intended to show the proper position to get the best results out of a clasp made in this particular form. Dr. Cummer of Toronto, who is an expert in clasp forming, especially of plate clasp metal, advises a clasp placed in that relative position. There is an objection to it, and that is the unsightliness that is produced when it is placed in that position, but whatever position we place the clasp, the point I would make is that we should in some way provide a lug or stay to prevent the clasp from settling and irritating the gingival tissues.

The grasshopper leg attachment, so-called, is a spring that is attached to the clasp and the lingual bar or saddle. Looking a case over yesterday with Dr. Roach he suggested that a logical solution is to overcome the very serious weakness in this form of attachment. For instance, if you take clasp metal or any of the alloys given us for clasp formation, especially hard clasp wire, and make a sharp bend, as indicated here, where the wire is bent back upon itself, that wire is going to be weak at the point where the bend is made and through the act of mastication the submucous tissue will allow it to settle at a time when the clasp will cause strain upon the angle, ultimately causing it to break. To overcome that, instead of bending the wire back upon itself, it would be just as effective if, instead of having a sharp bend, it should continue straight on and be attached to the lingual bar lingually of the incisors, and if the same attachment was placed on the opposite side, or let the same wire, after it is soldered to that particular point, go on and be attached to the clasp which may clasp the tooth on the other side. It would be more simple, much less difficult to make, and would be more efficient, and less likely to break. So I think Dr. Roach's idea there, is an improvement over the grasshopper leg attachment.

The suggestion made by Dr. Royce to modify the ordinary band clasp by sawing out a part so that you can bend the gingival parts in to better conform to the gingival portion of the tooth and grasp it better, is a decided improvement over the old-fashioned band clasp. The wire double bow clasp, which Dr. Roach devised some years ago, does the same thing and with less contact to the tooth, which is an advantage. So much for the forms of attachment without mutilating the teeth. Nowadays that seems to be the thing that is most desired. We often find teeth that are perfect in every respect and we do not wish to mutilate them in any way.

Coming to that part of the subject which relates to the mutilation of the natural teeth, Dr. Coltrin has covered that in a very thorough manner, but there are just a few minor things I want to speak of. This old-fashioned, much condemned open-faced crown, I think, has a place with us again. There was a time when we did think there was no great harm in devitalizing pulps of teeth. Now we know that there often is and we desire to keep the pulps of teeth alive as much as we can, and we have to use some form of attachment for vital teeth, and for that particular purpose the open-faced crown helps us out as an attachment for some few properly shaped teeth, like lower cuspids and sometimes incisors. Dr. Coltrin enumerated the objections that he had to it. It has a number of objections, but that crown can be made to fit by mutilating the teeth to which the attachment is made enough, and unless you desire to do that and make it fit, you had better not attach it at all. It can be made to fit a lower cuspid. Upper cuspids can be reasonably well fitted if we mutilate the teeth enough to get a good fit in the gingival portion. If you do cut considerable tooth structure, you must restore the tooth again to its natural form by adding gold enough on the mesial and distal surfaces to give the crown the proper formation to make the proper contact. With care and skill and keeping at it, we can make an open-faced crown so that it will do good service for an attachment or for one end of a fixed bridge.

This illustration is slightly misleading. I know that Dr. Coltrin does not intend that these lingual plates, which were made either by swaging or burnishing, and then reenforcing them, shall fit the lingual parts of the tooth. He does not intend that they should fit these loops. You should slip it on from the incisal to hook it over to keep it from moving lingually. The illustration is slightly misleading. He could not get the pins into position right. Another little criticism I want to make on the illustrations is this inverted cone effect on the end of this lingual bar. I think Dr. Coltrin has a misconception, because I know he saw this same idea given by Dr. Cummer. I may, however, be mistaken. As I remember it, instead of having this inverted cone shown in the form he has it here, it has more of a cone effect, with a construction next to the base end of the cone. I can see why, if you have a large enough opening on the inside, this form would hook into position, but if it is conical in shape, with a constriction, or neck, at the base of the cone it will be easier to place and remove and still be effective. I may be mistaken, but I cannot see how he can get this out unless there is a very large opening made especially on the inside of the denture base. I do not wish to say any more on the inside of the denture base. I do not wish to say any more, because there are other men, Dr. Conroy, Dr. Roach and others, who can say a great many better things than I on the subject.

Dr. J. K. Conroy, Belleville:

The problem of artificial dentures, confronted with crowns and bridges that we make, brings to us the problem of saving teeth and replacing those that are taken away. When we come to the problem of partial dentures, no matter what type of attachment we use, we must not lose sight of the fact that it is the gum tissue or mucosa that has to support the plate or denture, it makes no difference what type of clasp you use. If you can adjust the clasp so that it will not impinge upon the gum tissues, or rather will not interfere with the gingiva, and if the clasp fits the tooth properly, I believe you will have some degree of success. Clasps of all descriptions eventually cause the same result (I make that statement based on nearly eighteen years' experience) and that is the eventual crowning of the tooth, and the problem is to keep away from devitalization, to keep away from filling, and to keep away from all mutilation of the teeth as long as you can.

A favorite type of clasp that I have seen frequently (unfortunately, I do not live in Chicago, where I could get a chance to see some of the later types), is the type shown here, and also this type (Fig. 3, Chart 3). Both of those clasps do the same work. The clasp shown in Chart 3, Fig. 3, would evidently have to be made of stiffer or stronger material than the one shown in Fig. 1, Chart 8. The lug or rest shown here, used on the occlusal surface of a bicuspid, or any tooth you may apply it to, calls for some mutilation of the tooth. Where the occlusion is close, and where the enamel is abraded, and where it is continually covered, if there is not a self cleansing plate we are taught decay will occur. We are taught that decay seldom, if ever, occurs upon the smooth surfaces of the teeth and below healthy gum margins. If the clasp is adapted in this manner, and does not go beyond the gingival third so as to impinge upon the gingiva, you have some degree of safety. If you will apply the clasp with a lug in this manner you are taking some of the stress of mastication and placing it on the tooth more than you are on the plate. A clasp, in my opinion, that encircles the tooth should press upon the mesio-buccal angle of the tooth, assuming the majority of the stress. From what I have seen in these drawings I have never used a clasp of this type, and I am only speaking in this way from guesswork and from personal opinion, but I claim that right. It strikes me, if you have to remove a plate every evening for conserving the tooth or preventing decay, there is something wrong with the attachment. The gripping of the tooth mesio-distally may be the correct idea, but it has occurred to me that the gripping of a tooth mesio-distally is not compensated for when the forces of occlusion are so varied. In most cases of partial dentures on the lower jaw the force of mastication is mesio-distal to the plate, and it seems to me you are going to have too much stress placed upon the biscuspids, or the cuspid, and you are compelling your patients, as I have seen it done, to avoid that portion of the plate in the molar region for mastication and drift as far forward as they can. As for the other clasps, I know nothing about them. I have not seen them in the mouth. These forms of attachments may be satisfactory in the hands of a competent prosthadontist, but they involve considerable time and technic.

I just want to say a few words in closing about bridges. We are getting down to the mutilation of teeth. Ladies and gentlemen, whenever you cut into a tooth, whether it be for an inlay or otherwise, you have mutilated it. The tendency seems to switch away from the shell crown and every form of crown, but when you anchor a bridge in this manner you are only inviting trouble that will come to you very quick. If you will take the "B" form of an inlay for a bridge anchorage and possibly in this case fix it well into the mesial pit, there is no chance for the inlay to slip backward and start to leak. I thought I was an artist in making that type of bridge several years ago, but I have quit it. This form of bridge on Chart 11, Fig. 2, looks good to me on paper, but that is the only place it looks good. I question whether I would resort to the mutilation of a tooth so much as that form calls for without resorting to the shell crown. I am candid in what I say about it.

I have no criticism to make on the other forms of attachments because I know very little about them. A rather favorite form of bridge used some years back has been relegated to the rear, but as Dr. Dittmar points out, there are many cases where I feel justified in using it. It was not very long ago that I took the crown off from an upper tooth made by a dentist in Detroit and reset it. It had been in use about eleven years, came off, and the gentleman insisted on my placing a bridge on the lower jaw. There was no talking about any kind of attachment to him but the open-faced shell crown. He has been wearing a bridge for two or three years. I do not know how much longer he will wear it until decay will demand its removal.

Dr. F. E. Roach, Chicago:

It is really inspiring to me when I rise to discuss this paper. This is a magnificent array of charts, and my own experience in doing such work enables me to appreciate the immense amount of work that Dr. Coltrin has done. It is timely, and one of the most useful presentations this society has had in a long time. I am sure, from my knowledge of the subject, that you cannot get illustrations from the textbooks that are so comprehensive as these that Dr. Coltrin has given us. It is the time when we must take recognition of the necessity of saving the vitality of the teeth. It is contended that because a clasp will cause decay of a tooth, or the loosening of a tooth, or the injury of a tooth, we should condemn it, and then turn right around and take a stone and bur and cut the tooth all to pieces, put on a crown or some other means of attachment, devitalize, remove the pulp, and take chances. Where is the common sense of such an argument? To me it has no place at all, and I have no patience with it. I know that I am a little prejudiced on the subject of removable appliances. In all my professional career I have always been in favor of them for the conservation of the vitality of the natural tooth. I hesitate, I think seriously, and I rack my old brain trying to find a way in all cases to avoid the mutilation of the natural teeth. I value them, and for that reason I think it is our duty to study these various means of supplying the missing teeth in a way that will conserve the natural conditions of the mouth.

In the first place, one of the essentials is for the dentist himself to get right with reference to this matter. We can no longer be satisfied to go along making gold crowns and mutilating and devitalizing teeth and making ordinary rubber plates by means of suction or jamming and wedging them into place around the natural teeth, taking impressions with beeswax and modeling compound and plaster of Paris, and sending them to Chicago and to other places for men to make, and call these appliances fit for human beings to wear. I believe the time has come when we are going to be able to get a different kind of removable partial artificial denture. If we do not prepare ourselves to do this work in a more careful and painstaking way, I believe the time will come when the public will force us to do it. It is our place to prepare to do it, and without being forced to do it. I am not willing to accept Dr. Conroy's charge that there is a tendency in all removable appliances towards the destruction of the teeth in the mouth. That is not a serious objection that we can bring against a properly made removable appliance.. I could not afford to stand up here and talk to you in the way that I do if I did not know from personal experience that these appliances can be made, in almost all cases, in a way that will serve our patients both from a cosmetic point of view as well as from a useful standpoint without indiscriminate mutilation, and the sacrifice of the pulps of the teeth. A very large majority of our patients are in need of a little education along this line. A large percentage of the people that present themselves to me for service are opposed to removable appliances; there is a preconceived prejudice in the minds of the public at large against them. That prejudice can be gotten out of their minds by a little reasonable argument on the subject, and then by putting into their mouths appliances they can use. I think it is time for us to try and do better in this direction. I hardly know where to touch this subject in a detailed way.

In the first place, I want to disagree with Dr. Conroy again with reference to the support of these appliances. He made the statement that all these removable appliances should be supported by the soft tissues or the ridge, and no strain should be borne by the natural teeth. Later on, when he spoke of the occlusal rest, he alluded to the added support of the clasp carrying a part of the load. The very opposite should obtain in many of these smaller cases, particularly in removable bridge work *per se,* where you have cases of narrow ridges, where you are inserting one or two teeth, and where you have a small saddle, you must depend almost altogether upon the abutment teeth to carry the load the same as in fixed bridge work. Unless you do place the load upon the abutment teeth in these cases you may just put it down as being a positive failure in the great majority of cases, for the reason those narrow ridges will not offer adequate resistance to mastication stress, and as a consequence patients will either leave them out or they will shun that particular locality in mastication.

I believe that I am capable of taking pretty good impressions and making fairly accurate casts and carrying out my work in a reasonably accurate way, and as the years go by I am more convinced than ever that it is practically impossible to take an impression of these cases in any way, in the majority of instances, and make a cast upon which you can complete a removable appliance of this character and call that a finished product ready for the mouth. More and more I am dependent upon the very best impression that I can get, from which I will make the very best cast I can get, and then resorting to a step-by-step procedure, making one saddle and its adjacent attachment to the tooth, referring those back to the mouth and verifying this step and this saddle, and another saddle and its adjacent attachment, and referring that back to the mouth, adjusting and fitting in the mouth. That is the only way I am able to get these appliances so that when I put them in the mouth I do not have to fit the patient to the appliance or fit the appliance by a very long and tortuous route to the patient. It is simply a question of taking this care, and there is wherein our partial denture construction has been so deficient. We have not been careful enough in our constructive procedures to make these appliances so that they fit. We have so gotten in the habit of doing this work in a careless way, and very often the same men are doing crown and bridge work in the most beautiful and skillful way are careless and negligent of partial denture construction, for the reason they do not recognize the necessity for that accuracy of adaptation in this construction that they do in the other. I believe it is time for us to take a step, and give the time and attention that is necessary to devote to this construction, so that we may put these things in and the patient can go away and wear them. I know it can be done. Another very serious matter in the consideration of this subject is the matter of fee, and we have gotten too much in the habit of going along and letting the patient be the master. In other words, it is a matter of bringing the subject to the patient's attention in an intelligent way. If we present the matter and compare it with fixed bridge work, or compare it with any other work we do and explain to the patient that it takes time to do this work right, I find that patients are willing to pay, if it is properly done, as large a fee and many times a very much larger fee than they are for other types of appliances that supply these missing teeth. Many of these appliances can be made with gold attachments to the natural teeth, with vulcanite as a means of uniting the clasps and the porcelain teeth, and done vastly more economically upon your part and serve the patient just as well as a fixed appliance, and yet avoid the mutilation of the natural teeth.

Where I use sound teeth on both sides, in order to get proper stability of the appliance, particularly in an upper case such as this, I do not hesitate to cast a plate over the lingual surface of the cuspid tooth, and sometimes on bicuspids and molars, and covering the lingual surface of the tooth. Wherever possible, I avoid that by lingual bars and palatal bars, avoiding lingual contact with the natural teeth, but when it is necessary in these small appliances to get stability and retentive support, so that patients will get some use of the appliance, I extend completely up to the incisal and lap this appliance to the lingual surface of these teeth and take my chances. I am absolutely and uncompromisingly opposed to cutting off teeth and putting on gold crowns for the sake of putting clasps on those teeth. That is, to my mind, an intolerable thing, yet I know it is considered today an accepable pracice. A great many dentists are doing it. I know it because I have seen it. I do not believe that is conservative dentistry. When it is necessary to gain the proper support of these appliances, do not be afraid to put the appliance up on the lingual surface of the tooth and emphasize the imortance upon the part of the patient to keep that clean and leave it out at night. That is when the damage is going to take place. They can wear the appliance all day long all the time and not have any trouble with decay.

Dr. Dittmar:

If you should find a mouth that is susceptible to caries would you then make an appliance such as you have just described?

Dr. Roach:

Yes, I would. Let us assume we have a case like this, and there is a marked predisposition to decay in the mouth; let us assume that the teeth adjacent to that space are all right, I have put these appliances on in many cases of that kind.

Lastly, if Dr. Coltrin will continue this work we will have one of the best textbooks on the subject of removable partial dentures that has ever been written. I think the Society ought to appoint him as a committee to write a book on this subject. He is capable of doing it.

Dr. Edmund Noyes, Chicago:

We indulge in a great deal of talk about these partial dentures. I want to tell you, that unless you are careful your patients will think all they need to do is to take it out of the mouth and clean it thoroughly. You must make them understand that the mouth is just as dirty as the plate, and that they have to clean their mouths with more care than they do the artificial teeth.

Dr. J. K. Conroy, Belleville:

I do not want you to go away from here with the impression that I prefer, in short cases of this kind, to cut down the teeth and supply plates with gold crowns. Dr. Roach seems to lay particular stress upon the fact of cutting down the tooth for a gold crown. I do not believe there is any man in this country who makes less so-called shell gold crowns than I do. My contention is this, that the simpler the appliance that you can place around a tooth the better the tooth is, and the better the surrounding tissues will be, and regardless of the fact that the tooth should be compelled to support part of the mastication or to assist the partial denture. I feel that the tissues should do their work, also, and with the least obstruction that you will give that partial denture, if it properly fits the mouth. I am satisfied it will do the work, and my experience teaches me that if my patients could not wear the appliance that I have been giving them for the last fifteen years, I would not have had money enough to come up here and attend this meeting.

Dr. George D. Sitherwood, Bloomington:

I have had considerable experience in making both upper and lower partial plates, and this is certainly a splendid paper. In reality, it is a sort of history for clasp plates.

What Dr. Conroy has just said accords with my own experience. I made partial plates with flat clasps and was not very successful in one particular. The teeth decayed under these flat clasps, and then I began making them with this kind of wire clasp, which is easily adjusted. In bending these wires one day I said to myself, what is the use of bending the wire? Why not use a single wire which will answer just as well. Since then I have had much better success with a single round wire than with double wire in both upper and lower. I make a lower partial plate with single wire, No. 18 gauge, bending it around the teeth on either side for clasps and extending across the lingual front and letting the rubber flow around as we made the old-fashioned reinforced plates.

I want to emphasize what Dr. Conroy has said, namely, the simpler you can make a clasp plate, the greater the success you will have.

Dr. Coltrin (Closing):

First I want to correct the statement made by Dr. Dittmar in regard to the stud attachment (Chart 12, Fig. 3-A). The cone should be formed as I have stated and shown in the illustration. If it was formed as he said, "with the small end of the cone going into the recess first," it would bind just the same as if it was a straight round stud, only not quite so much. If it is formed so that the base of the cone goes in first, as I stated, the shank of the stud being smaller will allow the bar to be raised enough to release the stud without binding. Dr. Dittmar also called attention to a defect in the drawing which illustrates the pin and plate attachment (Chart 11, Fig. 1). In regard to that I will say that the mesial and distal overlapping edges were purposely exaggerated to prevent the plate appearing entirely flat.

I wish to thank the gentlemen who have discussed my paper. I appreciate both the helpfulness of their discussion in broadening the scope and adding usefulness to my effort, also the kind things they said about it. As to the length of the paper—and I admit it is long—I will only say, that I had to make my pilgrimage along the line of these twelve charts somehow, and in doing so was forced to use up considerable time. I thank you.

DISCUSSION ON THE PAPER OF DR. CULHANE.

Dr. E. K. Blair, Waverly:

Mr. President and Members of the Illinois State Dental Society: The very able paper presented by the essayist is a valuable contribution to our program. With the growth of the nation there have naturally arisen many complex problems pertaining to the care of those unfortunate people who are dependent upon their respective states for maintenance and professional services.

Illinois, the third most populous state in the Union, has many inmates in her charitable institutions. As wards of the state there can be no doubt as to the care that sould be bestowed upon these helpless people.

Many of our citizens do not realize that we have 20,000 insane patients under constant care, 365 days in the year, nor do most people appreciate the fact that this class of patients are far more difficult to treat than would be the same number drawn from the ordinary walks of life.

The absence of fresh air, of sufficient out-door exercise, of house diet, home cooking and the family circle all add much to the perplexities in ministering to their wants. Happily we are no longer debating the propriety of employing dental practitioners in state institutions. No well regulated private family is without the service of a competent dentist and we do not begrudge the helpless and infirm wards of the commonwealth any of the blessings enjoyed in our own homes. Scientific research has proven that one of the most important roads to health is through mouth sanitation and through repair of the masticatory organs. As an aid to the alienist it is an indispensible factor.

To the 20,000 helpless patients receiving such professional service during the year, who can estimate how often and how great the relief from pain, caused by diseased and defective organs found in the oral cavity, surely this is a field needing the attention of competent dentists.

To me it is especially gratifying to know that after thorough inquiry into the subject the assayist has been enabled to place our great state high in the list of states endeavoring to supply proper dental service to insane patients. It is not the first instance in which Illinois has blazed the way in matters pertaining to dentistry. This Society has been a beacon light on the outposts of dental progress for more than fifty years and if we are to judge the future by the past we have reason to hope that we shall continue to render a good account of ourselves.

In asking for the appointment of more dentists who should give their time exclusively to the inmates of the different state asylums you will be confronted with the fact that taxes are mounting higher and higher each year and the watch dogs of the treasury may urge retrenchment in expenditures, but this is no place to pursue an over-economic policy. The employment of competent dental and medical surgeons in our state institutions is not an extravagance but an economy.

Putting aside the humane aspect of the case and descending to consideration of the relative cost of the "care and keep" of the wards of the state there can be no doubt but that a patient, though of unsound mind, who is in proper physical condition, can be maintained at less expense, than those who are the victims of the numerous oral ills that flesh is heir to. It is well to keep this fact in mind as you present your claims to the powers that be.

My observation as a member of the State Institution Committee convinced me that there were legislators who were willing to supply the proper needs of the inmates of our eleemosynary institutions at any reasonable cost and there were other legislators who figured very closely any appropriations and were very exacting in their demands as to the financial wisdom of all expenditures. Both of these statesmen can be successfully dealt with if you are armed cap-a-pie and present your claims backed by proper data.

Incidentally I do not think wealthy inmates of state institutions should expect, nor should the state be required to furnish dental service involving expensive materials free of cost. Too often this is done and it involves as great a breach of propriety as though the state failed to supply proper dental services to those unable to pay for them. Under the management of the proper Board of Control it is to be hoped that a sufficient number of dental practitioners may be added to meet every requirement.

Present demands, including the call for dental army surgeons, the rapidly increasing call for operators who shall serve the fast growing population of this prosperous nation, and the tendency of many practitioners to engage in other lines of business, serve to demonstrate that our colleges should speed up the education work to the utmost. If not before, probably at the close of the war, the inmates of these state institutions may receive proper attention.

GEO. D. SITHERWOOD, Bloomington, Ill.:

After hearing such a paper one is greatly amazed to learn how many years the inmates of all these institutions were permitted to suffer from neglect of any proper care of their teeth. Dental service in any modern sense was counted out.

My first attention to such work was hearing the splendid paper presented to this society at Peoria in 1911 by Dr. J. L. Green, the physician in charge of the State Hospital at Kankakee, and also a member of the Board of Administration. The late Dr. Chas. R. E. Koch, who was a hard worker in every dental reform, had invited Dr. Green to deliver that written address. In discussing the paper Dr. George A. Zeller, superintendent of the Peoria Hospital for the Insane, gave testimony that the appointment of a dentist to that institution was almost coequal with the one at Kankakee.

In 1906 they had created the position of dentist, and in 1911 the place was still served on the plan of one-half day each week. At that time the visiting dentist had succeeded in treating thirteen hundred patients in a year out of the two thousand or more inmates, and he was looking forward to the time when they would have a resident dentist so the same attention might be given the insane that is given the normal residents of a community.

Dr. Arthur D. Black of Chicago at this same meeting related how fifteen Chicago dentists with their assistants had examined the teeth of the children at the State Training Schools for Boys and Girls at St. Charles and Geneva, and through Dr. Koch mailed a report of the examination to Dr. Green and Governor Deneen. In just a week from the day of the examinations Dr. Koch received a reply from Dr. Green, stating that the Board of Administration had considered the matter and had voted to employ a dentist in each of these institutions at a salary of one hundred dollars per month, with maintenance. I mention this incident to show what a society or a few dentists when they get together can do for the betterment of humanity when they take hold.

In order to get a nearer view of this subject I recently visited two of the State Institutions—the Soldiers' Orphans' Home at Normal, Ill., and State Reformatory at Pontiac.

At the Orphans' Home the dentist gives two half days a week with a salary of ten dollars per day. There is a very good equipment and fairly good operating room; but since the Home admits orphans from any indigent home the inmates have more than doubled, with the result that it takes two years' time to see all the children, numbering seven hundred, and give them the necessary attention of cleaning teeth, treating diseased gums and a few amalgam and cement fillings. The dentist in that institution should give at least two days a week time instead of one.

At the Pontiac Reformatory the dentist is on a salary of seventy-five dollars per month and gives about two half days per week to about a thousand inmates. Most of his work is cleaning teeth, extractions and some amalgam fillings. The matter of dental work is purely optional with the inmates. So of course they decide they will have a few dental operations, after the first prophylactic treatment. The equipment for dentistry in the institution is only fairly good, not nearly equal to that at Normal.

To most of the recommendations of the essayist I heartily agree, except that of State Dental Surgeon, which I think unnecessary and would only add expense or payment of money which could be used to better advantage, employing more dentists in some institutions and more time by the dentist in others.

From my viewpoint the dentists who give their services in these institutions are honest, capable men who do not need an overseer, but they do need (as suggested in the paper) to be made a part of the Hospital unit and co-operate with the Superintendent and physicians comprising his staff, and have a full equipment of instruments and furniture as good as the surgeons.

The only reason I can see for a State Surgeon would be in the matter of supplies, which I am told it not only takes a long time to get a requisition through, but quite frequently they are not of the grade or quality ordered, but a matter of that kind can be remedied through the Board of Administration.

While no doubt we should take pride in what has been accomplished by the dental surgeons in these institutions, we should also remember the rapid increase of inmates in some, and the requirement for better service in others which require more dentists. This paper is quite worth while and should help to stimulate the Board of Administration to make the dental services in the charitable and penal institutions equal if not better than any other that is required to give the inmates better health, and such dental aid as is actually needed under the present order of state care.

Dr. W. F. Whalen, Peoria:

I have enjoyed the paper of Dr. Culhane very much. I happened to be the man who helped Dr. Weatherwax to put in the equipment in the Bartonville Asylum and went there with him on several business trips. Dr. Weatherwax's report, which Dr. Culhane read, does not begin to describe the conditions as they actually are. There is no one who can command language that would describe the conditions we found at Bartonville. I believe it was the first institution that had a dental interne. Is not that so, Dr. Culhane.

Dr. Culhane:

Yes.

Dr. Whalen:

They had taken the patients from the county houses all over the state and were bringing them in trainloads—many were in straightjackets. Dr. Zeller, who was superintendent of the Bartonville, had a museum of all kinds of manacles and straightjackets that they had kept these patients in in the various county almshouses throughout the state.

I assisted Dr. Weatherwax in the work. We had the patients line up. They gave us a portion of a waiting room that had been used for the women, there being no suitable provision made for an infirmary. It was a large room and we put up our equipment there. We would have a line of from 20 to 30 patients at a time, standing waiting to be put in the chair. Their mouths were examined quickly and we extracted all the abscessed roots. As I remember, we extracted 212 teeth the first day. It is absolutely impossible the way the service is being rendered in the Bartonville institution at the present time to do justice to these patients. It is half a day a week. They simply cannot give the people anything like the service they should receive, and I believe Dr. Culhane's recommendation that a couple of dentists be appointed for the institution at Bartonville is a good one. It would not be any too many. I believe Dr. Weatherwax put in amalgam fillings and a few cement fillings in some cases. However, no attempt was made to treat the teeth as they should be treated. All teeth that were badly decayed were extracted. What Dr. Zeller said about the necessity of enlarging the work is true, every word of it, and I believe that Dr. Culhane's recommendation that every institution should have a dental surgeon in charge, or possibly two, where there are large numbers, as there are at Bartonville, is a good one. Possibly now there are over 2,000 inmates at Bartonville.

Dr. Culhane:

There are 2,200.

Dr. Whalen:

No one dentist devoting all his time at Bartonville could begin to care for all of them.

In regard to the dental surgeons, Dr. Blair or Dr. Sitherwood made the remark that they were honest men. Of course, they are honest men, but we must have somebody at the head of every institution or every department of every institution to get the highest efficiency along these lines. There should be dental internes in our public institutions, and there should be some supervising head. I do not think it would be necessary for a supervising dental surgeon to devote all of his time to any one institution; better than that would be a visiting surgeon. But there should be some one to drop around and co-operate with the dental internes of the various state institutions and unify and systematize the work to the end that the state would get the most out of the money they are investing in this department of work. I think such an arrangement could be made, and if it could, it would pay the state very well to have somebody to supervise it and I believe this society should get behind this movement and assist the dentists who have charge of this department in our state institutions and give them all the aid and suggestions they possibly can. I think it is a splendid and much needed work.

Dr. Culhane (closing):

I have talked with different officials of the state in regard to this matter and they agree that this work has been very much neglected. There is no great glory attached to taking care of the teeth of these insane wards of the state, and hence nothing has been done to further the work. If anything, we are not any farther ahead than we were six years ago, and that is not progress, gentlemen. I am simply pleading for better work, for more service to the poor wards of the state who are unable to work and obtain the service for themselves. If the Illinois State Dental Society does not push a proposition of this kind, there is no one else to do it. I have taken this up in my official capacity and in a private capacity, and I am sure that we can have the co-operation of the different men in charge of the various offices in the State of Illinois. The matter needs to be brought to their attention and brought in the right manner. I thank you.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held May 1, 1917, with the President, Dr. F. E. Roach, in the chair.

Dr. Elliott R. Carpenter read a paper entitled "Dowell Pin Anchored Inlays for Bridge Abutments."

DISCUSSION.

Dr. L. L. Davis:

It is certainly a delight to have Dr. Carpenter show us how to make a fixed bridge, and not destroy pulps, and have it efficient. We are under obligations to him for his unique method of locking those inlays in so as to stand the stress of mastication. I have had these things rock loose, but they have got to stay when they are put in as he has described. In fixing caps on movable bridges I have been using the gold screw which is manufactured by opticians for eyeglass work. You can get them just about the right length, and I can see they are the things that would fall in line very beautifully, and having a head to them, if you have a drill of the right caliber, when you set the screw right in, you can give it a couple of twists in the dentin and it grips more than cement would on a loose pin, and it can be easily removed. Supposing it is necessary to lift the inlay out or dislodge it, you have the top to dislodge of one of these inlays, and you would break the tooth undoubtedly. While I am not criticising Dr. Carpenter's method, I would suggest as an aid to it that the Doctor try the gold screw which will enable him to lift out the inlay or dislodge it if necessary.

The method described is very fine and I shall make use of it at the first opportunity.

Dr. J. G. Reid:

I do not know that I have anything in particular to say on this admirable paper. I have in mind, however, two or three small bridges I constructed a few years ago, and when I say small bridges, I mean a bridge of not more than one dummy; but the two I have in mind were of two dummies with the live pulps in them at the time they were set, and I simply put the pins through the inlay and soldered them in position. They fit in the cavities and in that manner I made the attachments with pins. The principle I believe to be good as a method of anchorage. The matrix was burnished into the cavity and the pins were put in and then drawn with wax and then soldered. The principle described of achoring a bridge I believe to be the best system that it is possible to establish. I believe the principle is better than to depend upon a square seated box inlay, depending upon that outside of the pin. Pins are essential to anchorage and are more durable in the end. This technic described I believe to be unique. The system is entirely new. I speak advisedly when I say that the bridges I have done that way have been very much more satisfactory, more permanent and more durable with the anchored pin in the cavity, and it has avoided destroying the pulps of teeth.

Dr. J. E. Hinkins:

I am not a very enthusiastic bridge man and never have been. I am also less enthusiastic over inlay bridges, and my practice has been that I would rather anchor a bridge to a crown than to an inlay in the cases that come to my office, but the method described by Dr. Carpenter looks very good to me. I have never put in an inlay bridge that I felt satisfied I had done the best service for my patient. To me this looks to be the best inlay bridge I have seen. I have never tried anything of this kind and I am a little skeptical about using such a method.

We have been through the age of the saddle bridge and the rest of those filthy appliances, but when it comes right down to good horse sense, I have respect for the natural laws, and I think when the Almighty created us in his own image and gave us thirty-two teeth he meant a special function for each tooth, and I am still of that opinion. In a four-tooth bridge or two-tooth bridge its usefulness will depend largely upon the abutments, and the teeth are limited in the extra amount of work they are required to do. As an illustration, four men can do the work, but two men cannot do the same work and last as long as four men could. I insert my bridge on that principle, and I would rather have a movable bridge or plate where it can be taken out and cleaned.

Dr. C. N. Johnson:

I am very much pleased with this paper because it gives us an additional method of anchoring these bridges and I must say that I do not feel as Dr. Hinkins does about this bridge work. We have seen too many cases of fixed bridges of, say, two roots carrying four teeth that have lasted a great many years. I am sure there are cases on record where fixed bridges have lasted more than twenty years. The peridental membrane will stand a great deal more force than is ordinarily brought to bear on the individual teeth. It depends upon the direction of the forces more than upon the extent of them, and if we can construct a bridge along mechanical principles so that the occlusion is correct, the membranes, if healthy, will take care of the stress.

My experience with bridges of this sort has been along a different kind of construction. I have been more familiar with bridges with inlay anchorages where the pins have been fitted into the wax model and cast in the inlay. There is an advantage in the method described by Dr. Carpenter over that in the fact that inserting the pins in this way you can get a different kind of retention. If the other pins are in the wax model they must be absolutely parallel and go to place with the inlay. In this instance there is a possibility of an undercut, and that is an element of strength, it seems to me, in this kind of bridge work.

I am deeply grateful to Dr. Carpenter for bringing this method before us because it gives me, at least, another way of anchoring these bridges, and I heartily commend this kind of anchorage for crowns of teeth to construct inlay work. There is no irritation of the gingival margin in this kind of bridge construction. It is a good anchor, and the principle is correct. I believe bridge work, judiciously used, is one of the best kinds of restorations we have where only a few teeth have been lost.

Dr. E. A. Royce:

Dr. Carpenter's presentation gives us a method of avoiding many of the pitfalls we have had in bridge work. It relieves us of the killing of pulps and of the irritation of the gingival margins by crowns. It relieves us of the loosening of the inlays and puts the work upon a good practical basis, and I personally thank him for presenting this method to us. It is the most practical method I know of and I believe he has given us a solution of the inlay for abutments.

Dr. Truman W. Brophy:

I have not done any of this work for a great many years and do not know much about it, but this thought occurred to me while Dr. Carpenter was reading his paper, and I would like to ask him this question: Why can you not thrust a pin into a hole in the inlay and down into the soft cement that is in there?

Dr. Carpenter:

That cannot be done because the point I made there was it was a dangerous procedure unless the bridge was very cold and you were deft and had good assistance to set the two abutments and four pins.

Dr. Brophy (resuming):

There is one feature of this work that appeals to me stronger than anything else, and that was referred to by Dr. Royce, namely, anything that can be done in the adjustment of a bridge that will securely fix it without devitalizing the pulp is certainly to be applauded. One of the greatest dawbacks I think in the adjustment of bridges has been the apparent necessity of devitalizing tooth pulps. The saving of pulps is the greatest problem before the dentists of the world today—to care for teeth from early infancy up to adult life and extreme old age so as to preserve the vitality of the tooth pulp, avoid pericementitis and the formation of dental abcess. If that can be done, it will put an end to a great amount of trouble we are contending with today. If that were done a great many medical men who claim the teeth are responsible for all diseases that they cannot otherwise account for, would be obliged to make some other explanation to patients. That is a strong point in connection with the method described by Dr. Carpenter tonight.

We all know that bridges have been made for quite a while and fixed by means of inlays in teeth the pulps of which are living, but we know that those bridges fixed by the use of inlays are not sufficiently anchored to prevent the bridge from sometimes becoming loose, and then it rocks and falls out. Dr. Carpenter has succeeded in developing an appliance by which those inlays that support a bridge can be securely fixed, and he can at the same time save the vitality of the tooth pulp, as he is not obliged to set pins into the tooth canal. Next to the invention of Dr. Taggart in making inlays I think Dr. Carpenter has done wonderful work in bridge fixation. I do not want Dr. Carpenter to feel that I am in any sense flattering him. I sincerely mean what I say. If that little device, which is so simple, can fix a bridge so that it will not get loose and, at the same time, save the tooth pulp, and avoid all the ills that occur following its destruction, he has done a work equal to that of Dr. Taggart in devising the inlay.

With reference to the pin. When I looked at that pin in its place in the inlay, it occurred to me it was too small for the hole. While I have never done this, if I were putting that pin in I would make it larger at the outer end than it is at the inner end, so it would fit the hole absolutely tight, so when you drive it in and cut the pin down and finish the surface there would be a perfect joint between the pin and the inlay.

Dr. William H. Andrews:

I did not expect to be called upon to say anything about this.

I have seen Dr. Carpenter developing the whole bridge. I would like to ask Dr. Ames a question, namely, at what point the cement crystallizes. I have made several of these bridges myself, and it has been my custom to set the bridge and pin at the same time, and Dr. Carpenter and I have had a good deal of argument pro and con regarding this. Personally, I do not think that the cement will set at the very instant it touches the tooth, and I think with three or four minutes' leeway you still have some give to the cement, particularly if it be slow setting.

Dr. Ames:

You should have some leeway if sufficiently mixed.

Dr. Andrews:

I set the pins within a minute of the time the bridge is put in place.

Dr. Ames:

That would depend on how accurately the pins fit in the holes.

Dr. Andrews:

If you thread the pins it gives the additional anchorage. I cut them off as near as I can with a finishing bur while the cement is soft.

Dr. Ames:

There is plenty of leeway as to time. It depends upon whether you wish to condense the cement.

Dr. Andrews:

I have never mixed my cement to that consistency. I mix the cement to the same consistency as I would for an ordinary inlay mix.

Dr. Ames:

You would have to have time to tease it to the bottom of the pin holes.

Dr. Andrews:

Most of these pins do not show any cement line at all.

Dr. F. E. Roach:

Dr. Carpenter has brought before us this evening something of a practical and very useful nature. He always does that, and for my part I appreciate this little stunt of his as much as any one. It is unique, and so far as I know it is a new way of anchoring inlays, and if my opinion is worth anything it is superior to anything we have been making in the way of inlay anchorages in vital teeth.

I have used a similar plan, as no doubt most of you have, to anchor inlays in teeth that have been devitalized by making a detachable single pin in tooth roots, the position of which is so greatly converging or so far from parallel that it was impossible to make a bridge with a fixed pin and place it after it was made, so that we have resorted to the same technic for anchoring single teeth in that position, but not in the way Dr. Carpenter has used it for anchoring into vital teeth. I fully realize that this is not a simple thing to do; it is not a simple operation. I would attempt a piece of work like this myself with a full realization of the fact that I had undertaken a very delicate piece of work. It is not a piece of work for the amateur or for the bungler. The construction of these inlays and the proper placement of these delicate pins and the assembling of them require deft fingers and careful operation. There is no question in my mind about that. So I would not recommend this as a procedure to be followed carelessly and indifferently by operators generally, not by that meaning to discourage or to disparage the merits of it. I value it highly.

With reference to the position of the pin, that of itself is an element of the greatest possible strength in the construction. The very fact that these pins are not parallel gives to the anchorage an element of great strength. The very fact that those pins diverge and stand off at an angle, rather than being parallel to the walls of the cavity and parallel to each other, adds great strength just exactly as the Creator in his construction and in his anchorage of the molar teeth that are to bear the brunt of strain in the force of mastication. They will resist the forces better than if straight and parallel with the crowns of the teeth. The principle of this anchorage is identical. I do not believe, Dr. Carpenter, that it is necessary to anchor these pins the sixteenth of an inch with the depth you have your cavities. In a young person I think it would be dangerous from the standpoint of encroaching upon the horn of the pulp, and yet there is another thing in favor of the position of these pins, and that is, there is less liability of encountering the pulp in anchoring the pins in that way than if they are put in and made a fixed part of the inlay, and are parallel.

I want to criticize one term Dr. Carpenter used, and I think he will take it in the way I mean it. I do not believe it is a good term. Dr. Carpenter used the term "both as a fixed fixture and a removable fixture." To my mind any appliance that is removable is not a fixture. I do not like the use of the term "removable fixture."

Dr. Carpenter:

Your point is well taken.

Dr. Roach:

You will pardon me for using that term in connection with removable appliances, calling it a fixture.

Dr. Carpenter says that a large per cent of his patients demand fixed bridge work.

Dr. Carpenter:

They do.

Dr. Roach:

Nearly all of my patients demand fixed bridge work, also. About five per cent of them get what they demand. It is up to us absolutely. I believe when people come to us we can convince them if we are satisfied in our minds that what they want is not right. In making that statement I do not wish to be understood as not believing in fixed bridge work. There is no piece of work that we can put in the mouth as a subsittute for the lost organs that is as efficient as a masticatory apparatus as a fixed bridge when it is judiciously selected and properly constructed, but I am unalterably opposed to the mutilation of good sound teeth any more for the purpose of making fixed appliances. I believe the time has come or is coming when we will be compelled to do less of it.

As to the use of fixed bridge work, and as to the relative tendency of teeth that are used as abutments for fixed bridges in the prevention of pyorrhea, or the maintenance of a healthy condition of these teeth for any length of time, it depends altogether upon the location, position and condition of these teeth. The fact that these teeth are bound together by means of splints or by means of fixed bridges, or by anything that will fix them together, will be a small factor in the prevention of pyorrhea. I have seen as many pyorrhea cases that occurred on fixed bridges as I have seen that were not utilized as abutments for fixed bridges. Of course, I do not mean by that that splinting of the teeth is not a very valuable aid in the cure of pyorrhea. A man will carry a fixed bridge to such a point, but he does not take into account the forces that are to be applied to the bridge, and it is often a bridge that is carrying only one dummy and has two abutments that is lost first. These abutments will be dislodged from their sockets in a great deal less time than a ten, twelve or fourteen-tooth bridge, for the reason the forces are constantly thrusting it out of the arch, and they are not properly articulated. You have two abutments carrying one dummy, that does not mean it will strengthen or lengthen the life of the tooth.

Dr. J. G. Reid:

I would like to ask Dr. Carpenter to give us a reason why there should be such a great depth to those anchoring pins in the dentin. Would not the sixty-fourth of an inch, as well as the thirty-second of an inch or one-eighth of an inch answer the purpose? It seems to me the sixty-fourth of an inch would answer the purpose as well as one-eighth of an inch.

Dr. Carpenter (closing):

As usual, the essayist derived more benefit from the discussion than from the writing of the paper itself. I have been very much pleased with the arguments that have been advanced, and I am sorry they were not a little more vigorous.

In regard to the question Dr. Reid has just asked, I will say that this whole scheme is so new that I am depending upon you gentlemen for suggestions so that I may correct the things that might be corrected to advantage in this system of work. My object in making the pins of the small gauge that I do is because the larger you make your anchor locking pins, the more tooth structure you cut away for the setting of the pins in the inlay. That was my prime object, and I could not see any reason why a pin of that gauge going to the small depth in the dentine would not be as strong. The length of the lock would be very little and it might be smaller. I think the argument advanced of making a shallower hole in the dentine is a good one.

Dr. Reid:

If you were depending upon the pin, you would want a deeper hole.

Dr. Carpenter:

It is a retentive pin; that is all that it is meant for.

Dr. Andrews (my associate) and I have been working at this for over two years, and we have gotten quite a few of these bridges in place, and up to this time they are doing good work. I have had the pleasure of having skiagrams made of two or three cases where it shows the pins pushing through into the dentine itself, so that we know the pins are in place. One skiagram was taken at such an angle as to show that there is a comfortable allowance of the pin away from the pulp itself, so that it is safe from the conduction of heat or cold.

I do not think there is much I can add to what I have already said except this is a process that requires very delicate manipulation, and you must make up your mind to that fact when you start, and the very least of all is the drilling of the wax inlays themselves. The introduction of graphite rods saves you a great deal of trouble later on. It is like mush when you drill it out and you have an established angle you do not change. We tried drilling holes through the gold in and out of the mouth and found it was absolutely impossible to get a true hole.

I have had only two years experience to report on this work, and it has been a source of great pleasure to me to have the assistance and cooperation of Dr. Andrews in this work. He has been most helpful.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

THE WASTE OF TIME.

If the average dentist were to be told that he wasted much valuable time every day he would either be incredulous, amazed or incensed—depending wholly upon his mental attitude at the moment. The fact is that most men have a very vague notion of the value of a minute, and while volumes have been written on the subject yet there are very few who do not in some way squander time as if it were an unlimited commodity. With every one of us time is limited and we should not waste a moment of it. This does not mean that we should put ourselves on a tension to watch the clock and count the seconds, but that we should so plan our day that the greatest possible utilization of time is accomplished without undue haste, and with as little tension as need be.

This is September—the month when we begin to settle down in earnest to the activities of the coming autumn and winter. Vacation is practically over, and the serious business of life is upon us. To accomplish the most we can before another vacation season is the ostensible desire of every energetic man. It is an opportune time to study carefully our daily routine and see wherein we may effect a saving in minutes or hours which heretofore we have been wasting. There are many ways in which waste of time may occur. Elbert Hubbard used to say that it was time wasted to read the newspapers. This is not altogether true, but it has an element of fact about it. Much time is wasted in reading inconsequent and frivolous matter in the newspapers—matter which leaves us not a bit better informed on the real problems or affairs of the day. That so much of this kind of matter is published in the newspapers is not the fault of the papers so much as of the people. This is an old question which cannot be argued here, but the fact remains that with all the necessity of having the legitimate news of the day placed before us in the daily press there is an enormous aggregate of time wasted in reading news that cannot be called legitimate.

Then there are other ways in which much valuable time is wasted—by some in one way, by others in other ways. Each man must analyze his own expenditure of time and seek out the waste places and eliminate them. It is perfectly safe to say that in the lives of most men there are at least two hours a day that might be used to better advantage than they are by proper arrangement and systematization of time. What these two hours will accomplish for an individual in a year if used for some efficient and elevating purpose can scarcely be estimated till it is tried. To spend two hours a day in the pursuit of knowledge on any given subject will result in a vast fund of information on that subject in a year. To follow this up year after year will soon result in a liberal education. This will lend a zest to life and make each succeeding year more and more interesting. The possibilities of twenty-four hours are wonderful, and what shall we say of weeks and months and years? None of us accomplish what we should, but all of us could accomplish far more than we do by eliminating waste of time. And we would be happier, and the world would be better. It is well worth trying.

THE EDITOR'S DESK.

AN OPEN LETTER TO THE MOTHER OF A DRAFTED BOY.

My Dear Mrs. ———

I know you are a good woman, although I have never seen you, and no one has ever told me about you. The reason I know is because of the way in which you write about your son. All mothers love their sons, of course, but there is something about the tone of your letters which makes me set you apart in my estimation as a very rare mother. You say he is a dental student and you wonder if students are not to be exempted from military duty and permitted to pursue their studies and complete their course so as to be available for dental service in the army. You are willing that he should serve his countrty in this capacity, but you do not want him to go into the trenches.

Well, there are two sides to every question. Probably if the government knew as well as you and I do about the scarcity of dentists, and how valuable dental service is in the army and navy there would be exemptions in favor of dental students, and a request for colleges to keep open continuously to prepare young men for this service as rapidly as possible. To this you would agree, I am sure. But probably if you and I knew how much influence is brought to bear upon the government for exemptions of all kinds, we might change our point of view. What about the medical student, the engineering student, the chemistry student, and the agricultural student? All of these might logically claim exemption on the ground that they could serve their country better in their respective capacities than on the firing line. At this rate the government might go on exempting till it had no fighting men at all, and it so happens that it requires fighting men to help win a war.

I am sorry about your Boy and I am particularly sorry about you. War is harder on mothers than on any other class. The boys are in it, and while it is difficult, disagreeable, dangerous work, yet they are playing the game, and know precisely what is happening. Bad as this is, it is better than remaining at home and helplessly suffering all the agonizing uncertainty and apprehension, day after day and night after night, with the gnawing anxiety constantly eating like a canker into the very heart.

And yet it is a matter of record that mothers have been braver than any one else. Yesterday I talked with a mother who has three sons at the front—two of them badly wounded. It would scarcely be logical for you to claim that your boy is dearer to you than those boys are to her. And yet in her demeanor there was no lament, no resentment, no rancor—only occasionally a tinge of sadness mingling with her sublime patience and courage. The other day another mother told me with cheerfulness of her two children, one a boy and the other a girl. Both are married. They had been reared in the lap of luxury. The boy has given up a good, lucrative position in Chicago with promise of immense possibilities financially to do ambulance service abroad. And that girl—what do you think she is doing? I recall her as a dear, delicate, dainty little girl growing up, wrapped about and guarded with all of the luxurious indulgence of a wealthy American home. I had always looked upon her as a frail, tender plant—hot house in variety. But "you never can tell about a woman," particularly in war time. Her husband conceived it to be his duty to go over to Europe and help. She refused to remain idly at home when she felt she was needed elsewhere, and today—can you imagine it?—that delicate girl is driving a truck taking supplies to the front! Her knowledge of operating an automobile was probably gained as a mere pastime from her father's liveried chauffeur along the roads of the North Shore in Chicago. Now she is putting her knowledge gained as a pastime to a useful purpose and is growing stronger and more self-reliant every day. Would you claim that this dear mother thinks less of her son and her daughter than you do of your boy?

You say he was one of the first to be drafted, and I think I detect a note of lamentation and despair in your remark. I sympathize with you from the bottom of my heart, but please let me suggest a few things for you to think about at this time.

Human life is very dear, and yet you would willingly lay down your life for your boy. You even placed it in jeopardy, cheerfully, gladly, when you brought him into the world. Self sacrifice is the sublimest sentiment of which human nature is capable, and no individual or nation is safe without it. And remember this, just so soon as an individual or a nation begins to hold life in greater esteem than it does principle or devotion to duty just so soon is there an inward disintegration of character which is the sure precursor of deterioration and decline. Had it not been for the conviction in the minds of the founders of this country that human life was less in importance than the establishment of high ethical standards of life and administration you and I should not now be enjoying the privileges of a free and liberal form of government.

It has only been by self-sacrifice that the principles of liberty and justice have been attained and it will only be by self-sacrifice that they can be preserved. It is a pathetic incident of this self-sacrifice that innocent lives are lost, and that the flower of our young manhood is crucified. But better this by far than to give up one jot or tittle of what we believe to be just and right, or to recede one inch from the sacred line of our highest ideals.

I think I hear you say, "It is easy for this man to write like that when he has no son to send to war." It is not easy. I abhor war with all the agony of my soul. I have never been able to glory in the panoply of war. To me the glitter of the sword and the blare of the trumpet have never appealed. I have always had more vividly in my mind the suffering, the sorrow, the blasted hopes, the degradation, the destruction, the bestiality, the cruelty, the injustice and the awful horror of war. But I say to you with my hand on my heart, that I would rather face this horror, I would rather crawl along on hands and knees in the bottom of a filthy trench at midnight, I would rather grope in the dark in the slime and muck of a blood-soaked "no-man's-land," I would rather have my nostrils filled with the sickening stench of putrid human flesh, or lie racked with pain on a sun-baked plain, I would rather be wounded nigh unto death—yea, I would rather accept death itself, a thousand times—than to yield in the least from the line of what I thought to be right, or submit to what I thought was oppressive. And so, I am sure, would your son when he stops to consider it, and I am also sure that down in your heart you would not have him otherwise.

I have said that I abhor war, and that is equal to saying that I love peace. I am sure that you and I agree in this—and yet—and yet, I am told by those who know more about it than I do that there are times when *war* is the price of *peace*. I was shocked when I first heard this and I doubted it. At least I tried to make myself believe that it was not true, but after studying the progress of human events I am not so sure of my ground. Possibly the perfect understanding, the delightful peace which I am sure now exists between you and your dear boy was in a measure established by a long series of mimic warfares from his baby-hood up. If this is not true he is unlike most boys. After all, it resolves itself down to a process of evolution, the laws of which are the same whether in individuals or in nations.

As a mother you have before you a terrible conflict. You have the conflict which is inevitable between the yearning motherly love which has hovered over your boy and protected him during all the years of his young life—the conflict between this and the nobler, grander sentiment which prompts you to offer the most precious possession of your heart to the great aching world, casting your lot with the noble army of mothers whose self-sacrifice and abnegation have been the one sublime heroic fact in all the ages past.

I wish with all my heart that I could aid you in your coming conflict. I would willingly lose much sleep and suffer much pain to help you, but it is the penalty and the glory of your motherhood that the decision must be yours and yours alone. The consolation is that when the victory is won it will be *your* victory—no one can take that solace from you.

Sincerely your friend,

C. N. Johnson.

BOOK REVIEWS.

Dental Materia Medica and Therapeutics. A Text-book for Students and Practitioners. By Herman Prinz, A. M., D. D. S., M. D. Professor of Materia Medica and Therapeutics, The Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; formerly Professor of Materia Medica, Therapeutics and Pathology, and Director of the Research Laboratory, Washington University Dental School, St. Louis. Fifth Edition, Enlarged and Revised According to the United States Pharmacopeia, Ninth Decennial Revision. 660 pages. Published by C. V. Mosby Co., St. Louis, Mo.

The fact that the fourth edition of this splendid work was exhausted within a year speaks for the excellence of the book. It has been adopted by the U. S. Army, and every Dental Unit going to France will carry with them a copy of this publication. If this were not a sufficient recommendation for the book a mere glance through the volume will convince the most skeptical of its value. To go into a detailed review of the many excellent features of the book is beyond the limits of our space, but we invite the reader with all confidence to get the book and examine it for himself. If he does so he will not be disappointed.

CORRESPONDENCE.

LETTER FROM DR. D. N. LEWIS.

To the Editor:

In the May issue of the Dental Review Dr. J. L. Hoover has an article entitled "Prevention of Pyorrhea Alveolaris." In this article he advocates the preservation of the third molar on the ground that it continually presses forward and holds a close contact between the other teeth. I think his philosophy is just about as reasonable as that of the man who in "thinning corn" was "pulling out all the big stalks to give the little ones a chance."

The molar teeth all have a tendency to move forward—they never drift backward—and I believe that if they are not capable of holding their own contact with the next tooth in line the third molar will seldom, if ever, cause them to do so.

I must be one of the "erring" whom the Doctor describes, and I conscientiously believe I am right. My observation, and I believe that of the great majority of the profession, is the very antithesis of Dr. Hoover's regarding the development of the third molar. From the point of the cusps to the apices of the roots it is an anomaly—it is rudimentary in development, has no uniformity of shape, size, density or constituents, and its position is rarely that of a normal tooth. It is useless and a nuisance. Too far back in the angle of the jaw for the tongue and cheek to manipulate food in mastication, it cannot be kept clean, and is so very greatly predisposed to decay.

In view of these facts,—and for the promotion of cleaner, healthier mouths, and happier patients—I say:—Extract the offensive third molar. D. N. Lewis.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Hand Cleanser:—There is no more effective hand cleanser than soap and corn meal used together. While it is old fashioned it is harmless and does the business with dispatch.—*H. A. Cross, Chicago.*

To Prevent Leaking at Piston of All Metal Syringe:—Cut a disk out of a piece of rubber from your bellows and put between the leather disks of packing. Lubricate with vaseline and no more trouble.—*H. Reid Staley, Harvey, Ill.*

Caring for the Hands:—K. Y. Lubriacting jelly used before operating imparts a delightful softness and pliancy to the hands that materially aids the dentist, who does his own laboratory work, in having nice operating hands. Van Horn & Sawtell, 15 East 40th street, New York City. furnish it for the medical profession.—*Homer Almon.*

The Up-Keep:—"It isn't so much the original cost but the upkeep" that is vital in dentistry. No mattter how beautiful and well done your restorations may be, their permanency or failure will be in proportion to the enthusiasm and co-operation between you and your patient in your regular prophylactic treatments aferwards.—*J. Frank Nelson, Chicago, Ill.*

Root Canals:—I get better results by the use of irridio-platinum wires in root canals I radiograph. Keep an assortment of different sizes and lengths, and finish to a fine point at one end. I heat them to sterilize before and after using and use the same one indefinitely. Gauges 23, 24 and 25 are the ones I use mostly. You will find this saves you time, having them ready and tends to standardize your work.—*Homer Almon.*

To Work Ames Black Copper Cement:—This may be worked so as to allow more time before the mix sets if mixed upon a cold water bottle slab. The fluid cement may be dropped into place often in tooth when it almost flashes into a set, so quickly does it harden as it acquires the tooth temperature. Also in setting crowns copper cement mixed upon cold slab offers similar advantages and may we not thus eliminate the disgusting putrefaction of material absorbed in zinc cement under crowns?—*J. F. F. Waltz, Decatur, Ill.*

Posts for Crowns:—The most satisfactory post for a detached post crown is made of round clasp metal wire, fifteen to eighteen gauge. Cut post the desired length with wire cutting pliers, and with same pliers cut six or more notches, opposite and alternate, at close intervals near the root end of the post, to a depth of about one-third the thickness of the wire. When secured by cement, these notches aid in retention and prevent post from rotating. The portion of the post extending into the porcelain is also notched in the same manner. By the use of pliers these posts are quickly made and no gold is wasted.—*D. N. Lewis, Lake Forest, Ill.*

To Fill Fissure Cavities in Molars and Bicuspids:—Efficiency in the filling of molar and bicuspid fissure cavities with gold. Suppose the first and second molars and first and second bicuspid fissures are defective. Apply rubber dam on clean teeth, from second molar to cuspid. With inverted cone burs No. 33½ cut out fissures in both bicuspids and follow up with cross cut fissure burs .557. Break down frail enamel and trim margins with sharp chisels, the assistant blowing a constant stream of cold air into cavities. With the hand mallet in the hands of an efficient assistant these cavities can be filled in a surprisingly short time, using Pack's cylinders Nos. 1 and 2. Your patient will many times think you have filled only one cavity. Finish as usual. Next, without waiting, but with a kind word and a smile immediately cut out the fissures as before, in both molars and fill these also, carefully but rapidly. All this can be done at one sitting for many patients. The length of the sitting depends on the size of the cavities and the efficiency of the operator. If this is too much for you or the patient, do only half as much. However, never sacrifice the result of the operation for rapidity.—*W. O. Fellman, Oak Park, Ill.*

MEMORANDA.

DEATH OF DR. I. B. JOHNSON.

Dr. I. B. Johnson of Onargo, Ill., died at his home, July 27th, 1917, after having practiced in Onarga for thirty-six years. He was a faithful member of the Illinois State Dental Society and was constant in attendance. He leaves a wife and two daughters, Mrs. Edith A. Smith, of St. Louis, Mo., and Mrs. Elsie J. Stevens, of Gary, Ind., to whom the DENTAL REVIEW extends its sympathy.

TWENTY-FIFTH ANNUAL SESSION OF THE NATIONAL DENTAL ASSOCIATION.

New York City, October 22, 23, 24, 25, 26, 1917.

(All sessions of the Board of Trustees, House of Delegates, General Sessions, Section Meetings, Clinics (except Surgical Clinics), exhibits will be held in Hotel Astor.)

The following additions may be announced to the program as already published.

Monday, October 22nd.

Registration, Laurel Room, First Floor.

First Session—Board of Trustees, 11 a. m. (Rose Room, First Floor).

House of Delegates.

Opening Session, 2 p. m. All sessions of the House of Delegates will be held in the Rose Room, First Floor.

Second Session—Board of Trustees, 4 p. m. (Rose Room, First Floor).

FIRST GENERAL SESSION.

Tuesday, October 23rd, 9 a. m.

Hotel Astor. (Grand Ball Room, First Floor.)

Invocation.
....New York City
Address of Welcome—Gov. Charles S. Whitman, on behalf of State
....Albany, N. Y.
Mayor John P. Mitchel, on behalf of city..................New York City
President's Address—LaFayette L. Barber......................Toledo, O.
Oration—E. C. Rosenow, M. D.........................Rochester, Minn.

A research member of the Memorial Institute for Infectious Diseases, Chicago, and Professor of Experimental Bacteriology in the University of Minnesota and the Mayo Institute.

SECOND GENERAL SESSION.

Tuesday, October 23rd, 8 p. m.

(Grand Ball Room, First Floor.)

Research Department.

Pathological, Bacteriological and Clinical Studies.

"Dental Caries," by Russell W. Bunting and U. G. Rickert (B.S. M.A.). Work done in, and with the assistance of the University of Michigan.

"A Study of the Pathology of the Peridental Membrane," by Frederick B. Noyes. Work done in, and with the assistance of, the University of Illinois.

"The Histopathology of Chronic Periodontitis and the Pathogenesis of Dental Root Cysts," by Thomas B. Hartzel and Arthur T. Henrici (M. D.). Work done in and with the assistance of the University of Minnesota.

"A Comparative Study of Oral Focal Infections", by Weston A. Price and

Milton J. Damlos (D. D. S.) Research Institute Laboratories, Cleveland, Ohio.

THIRD GENERAL SESSION.

Wednesday, October 24th, 8 p. m.
(Grand Ball Room—First Floor.)

Herbert L. Wheeler, Chairman, New York City, Dental Surgery and Restorative Protheses in the European War.

Symposium—"*Dental Surgery and Restorative Protheses in the European War.*"

"*War Dental Surgery," by*..

"*War Dental Restorative Protheses," by*..................................

It is expected that Mr. Robert Bacon, Ex-Ambassador to France, will preside, and that the Surgeons General of both the Army and Navy will attend. A description of the work done in Europe will be given by one who has had experience there.

It is anticipated that both the Medical and Dental Professions will be represented.

There will also be pictures of "War Surgery."

Herbert L. Wheeler, *Chairman.*

FOURTH GENERAL SESSION.

Thursday October 25th, 8 p. m.
(Grand Ball Room—First Floor.)
Oral and Dental Hygiene—Mass Meeting.
Charles H. Oakman, Chairman, Detroit, Michigan.

"*The Importance of Dental Infections as Related to Urinary Tract Diseases, with Particular Reference to Ureter Stricture and Its Sequelæ.*" Guy L. Hunner (S. B., M. D.), Johns Hopkins University, Baltimore, Md.

RESEARCH DEPARTMENT.

Wednesday, October 24th, 1:30 p. m.

"*Root Canal Fillings,*" by John R. Callahan. Work done in, and with the assistance of, the Cincinnati General Hospital.

"*Studies Upon the Bacteriology of Dental Caries,*" by Percy R. Howe. Work done in, and with the assistance of, the Forsyth Dental Infirmary.

"*Quantitative Determinations of Certain Organic Substances in Saliva and Their Relation to Oral Conditions,*" by John A. Marshall (M. S., D. D. S.). Work done in, and with the assistance of, the University of California.

"*Electrolytic Medication—Physiological and Dental Aspects,*" by Samuel E. Pond (B. H., A. M.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

Thursday, October 25th, 9 a .m.
Chemical and Metallurgical Studies.

"*Dental Cements,*" by Marcus L. Ward. Work done in, and with the assistance of, the University of Michigan.

"*Progress of the Investigation of Mottled Enamel,*" by Frederick S. McKay, Colorado Springs, Colo.

"*Studies of Internal Secretions in Their Relation to the Development and Conditions of the Teeth,*" by William J. Gies (M. D., Ph. D.). Work done in, and with the assistance of, the Columbia University.

"*The Relative Efficiency of Medicaments for the Sterilizing of Tooth Structures,*" by Matilda Moldenhauer (A. B., M. S.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

Tuesday, October 23rd, 1:30 p. m.
(College Hall—Eighth Floor.)

"The Relations of the Dental to the Medical Corps of the Army," by Victor C. Vaughan (M. D.) Ex-President of the American Medical Association, Member General Medical Board of the Council of National Defense, Washington, D. C.

"The Value of the Educational Work as Being Executed by the Preparedness League of American Dentists," by Frank M. Casto, Cleveland, Ohio.

"Report of Sectional Units of League by States—A to N Inclusive."

Thursday, October 25th, 1:30 p. m.

"Stereopticon Lecture on Fractures of the Bones of the Face." (Synopsis: This lecture will include the consideration and treatment of Gun Shot wounds; removing foreign substances; the sterilization of wounds; the proper adjustment of fragments and the means employed to mobilize them. In the treatment of injuries of the face, the primary step should be after removing foreign substances, to establish as nearly as possible asepsis. The use of grafts of bone, modeling compound, hard rubber and metals to replace lost parts.)

"The Dental Ambulance in War," by George B. Hayes, Neuilly, (Paris) France.

"Report of Sectional Units by States—M to Z Inclusive." (An interesting Preparedness Exhibit will be shown, including Dental Ambulances, Base Hospital, Field Hospital and First Aid Equipments; in fact, everything relative to the service of the Officers' Reserve Corps, Dental Section and Red Cross Officers will be present to give instruction and information. The ambulances shown will be sent to France as the gift of members of the Preparedness League and appreciative patients.)

ANESTHETISTS' SECTION.

Wednesday, October 24th, 1:30 p. m.
(East Ball Room—Eighth Floor.)

"The Teaching of Local Anesthesia," by Theo. Blum, New York City.

"The Relative Toxicity of Local Anesthetics," by George B. Roth, Washington, D. C.

"Cause of Failure and Untoward Sequelæ in Conductive Anesthesia," by Richard H. Riethmiller, Montclair, N. J. (Illustrated by Moving Picture Film.)

Thursday, October 25th, 9 a. m.

"After-pain in Local and General Anesthesia," by A. E. Hertzler, Kansas City, Mo.

"General Anesthesia for Oral Surgery," by Herbert A. Potts, Chicago, Ill.

STATE SOCIETY OFFICERS SECTION.

Wednesday, October 24th, 9 a. m.
(College Hall—Eighth Floor.)

"Post Graduate Course," by B. L. Shobe, Tulsa, Okla.

"State Legislation from a Dental Standpoint," by A. H. Reynolds, Philadelphia, Pa.

"Taking an Invoice of Our State Societies," by Otto U. King, Huntington, Ind.

Wednesday, October 24th, 1:30 p. m.

"Organization," by J. P. Luthringer, Peoria, Ill. Symposium—*"Methods Used in Handling the Mid-Winter Dental Clinic, Atlanta Dental Society,"*

by Thomas P. Hinman, Atlanta, Ga.; S. M. Cameron, Philadelphia, Pa.; Benjamin Sandy, Minneapolis, Minn.; Henry L. Whipple, Quincy, Ill.

(These papers will be limited to ten minutes each, and followed by general discussion.)

R. Ottolengui, *Publicity Committee.*

COLLEGE COMMENCEMENTS.

THE COLLEGE OF DENTISTRY, UNIVERSITY OF SOUTHERN CALIFORNIA.

Graduates: R. H. Alexander, J. E. Armitstead, C. P. Ballard, N. L. Beesemyer, E. W. Blurock, J. C. Bogart, C. H. Brown, Jr., E. M. Brownson, C. R. Casebeer, V. W. Chatterton, C. Cole, A. G. Cook, S. Covert, R. F. Critchlow, J. E. Eames, G. A. Ellsperman, E. C. Epstein, F. B. Foster, C. G. Gould, C. O. Greef, F. W. Gum, W. E. Guth, E. J. Hawks, J. F. Hill, H. V. Holcomb, P. T. Holcombe, J. M. Howard, L. B. Hutchason, T. H. Kurata, H. I. Kurisaki, W. S. Lackner, W. C. Lardner, R. Larson, J. G. Leavitt, J. C. Miller, F. C. Montgomery, T. L. Moon, L. P. Nielson, R. F. O'Brien, H. P. Petersen, S. Purviance, E. E. Ramsaur, B. L. Reese, D. D. Rush, L. Siever, R. B. Slater, W. E. Smith, J. W. Snyder, J. A. Schwamm, A. S. Schwartz, J. E. Scruggs, H. F. Standefer, J. O. Stoker, H. Straub, E. H. Wessell, H. A. Whipple, C. H. Williams.

THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, OCTOBER, 1917 No. 10

ITEMS OF COST TO BE CONSIDERED IN RENDERING DENTAL SERVICE—ALSO MEANS OF DETERMINING FEE IN ESTIMATING THIS SERVICE.*

BY E. A. SCHMUCK, D. D. S., CHICAGO, ILL.

It has been the custom for men with a unity of purpose to discuss subjects in common, for such discussion permits a greater scope for the attainment of knowledge whereby the individual may profit by the experience of one or all.

Your Society was conceived in order that you might attain these advantages, so when I was asked by Dr. Crossan to give you my experiences and conception of Cost Accounting in Dentistry I knew I had a task to stimulate me to put forth my best efforts in gathering authentic statistics to submit to you for discussion.

Cost of the daily service we render our patients is as important to us as the selling price is to them, so let us then take up this discussion of the items of cost to be considered in rendering dental service and the means of determining fee in estimating this service.

At the conclusion of our course of study in dental college, resulting in the acceptance of a diploma, and later, after deciding upon the location of an office, we did not quite realize that the "ideal" of our dreams of a "lucrative practice" meant that we had but then just reached the "goal of opportunity."

Later, after conducting our practice for several years and flirting with opportunity, we began finally to realize that our so-called remunerative development in the future was dependent, first, upon the quality of our service, second, upon the people whom we were giving service to, and third, upon ourselves regarding the lucrative compensation for this service.

We saw with rather a blurred interpretation that to make our

---

* Read before the Winnebago County Dental Society.

"Success Dream" come true, our shortcomings must be remedied to mutual advantage, in order that we might deserve the remuneration due us, in return for our service to humanity.

Little or no reference was made in our college course to the subject of "Business Principles in Dentistry," and it is only during the last few years that articles on this subject have appeared in our dental journals.

I have been an interested student of this subject called "Business Principles," and for a number of years have perused these articles in hopes that I might find some definite, conclusive system to apply, but so far, this subject has been presented and discussed in a very disappointing way.

I find that while each gives plenty of good advice as to generalities, yet to my knowledge the system of ascertaining costs has never been worked out in a systematic manner, so in presenting this subject I shall endeavor as far as possible within my ability, to do so in detail and adhere to a system and a definite division of our different expense items.

No doubt each and every one of you have had some thoughts on this subject, and my mission is not to dictate, but to agitate your minds relative to this system, and I feel that there will be rather a rude awakening to some of you who may have thought that each hour of time spent in practice has been a remunerative one. It should also stimulate to acute realization the heretofore unknown factors of your items of cost.

Business success is dependent upon the study of costs, but the average dental office has been run too long on the authority of experience only; consequently the time has come when we will have to let facts and figures of cost be our governing power of deduction.

All business men and manufacturers place a price upon their product. In consequence no trouble is too great that enables them to get results in ascertaining the proper selling price of their commodity. If they do not get results, meetings are held and arrangements are made, relative to the employment of cost experts who do take facts and figures as a basis of definite determination, for the law prevailing in every department of life and a law upon which all business credit is based today is that the selling price shall include costs and profits.

Dental service rendered to patients is our commodity and our ascertainment of its selling price must then also depend upon its costs.

Every instrument and all equipment in your office may be of the latest model or pattern but if your business is conducted with an antiquated and inefficient system, you will find yourself facing disaster and looking for the most positive means of analysis, in order to protect your future business welfare and service-giving ability.

We, as professional men, may say that our object is to serve humanity: Nevertheless every service involving the payment of money is a business transaction, at least is so considered by our patients, and unless we apply ourselves more to the business side of this transaction and forget the illusion that it is unprofessional to consider proper remuneration for our service, our combat with the increased high cost of living in the future may end in a business failure.

Therefore in discussing this subject, my purpose shall be this: To make you realize that the systematic knowledge and analysis of your business is not beyond the dignity of a professional man and that the minimum amount of your remuneration in form of a fee, depends upon your finding your own definite cost of service, to be determined by your own knowledge of the time, expense and gross receipts involved in your individual practice.

To intelligently arrive at what should be termed adequate compensation for dental service, let us then proceed to ascertain the items of cost to produce such service:

The three factors that enter into our "costs" are:

First.—Material and direct productive labor expense.

Second.—Annual overhead burden and general expense.

Third.—Fixed annual cost of profit expense.

Referring to mimeograph copies furnished you, let us go over the items of the first page that enter into direct productive labor and materials: Those relative to the necessary personal application of direct service, or so-called labor in the operating room and laboratory, together with the expenditures for materials to complete production.

Precious Metals in connection with *teeth, facings,* and *backings* are perhaps the largest individual cost items in the production of our service, but it is very important in computing our cost of service not to sell these articles alone at a profit, for there are still numerous other factors to consider and to add to the so-called "cost of materials."

Materials and *merchandise* include everything used in the routine of our work and the bulk of our supply house bills are composed of these articles.

Laboratory bills are considerable unless you employ a laboratory assistant and frequently laboratory service is the only means of side-stepping the objectionable features of vulcanizing odors, etc. Add this to productive cost.

Light, power and gas are necessary factors in productive service and must be added to this group of items.

Our assistant's salary is not all applicable to direct productive labor, so only one-third of her salary can be charged to direct production as that is the average time of each day that she is employed in rendering direct service to your patients. The other two-thirds must be charged to general overhead expense as she merely promotes speed and efficiency to your direct service.

The last and most important item of this group, because it is our own "Bit," so to speak, is salary. It is the price we set upon our own direct productive labor or service and the yearly amount must be determined on a sliding scale according to the personal equation. Therefore I will only attempt to consider in discussion the minimum amount of this item.

What graduate nowadays cannot command $35.00 to $50.00 per week even as an assistant?

So I should say that in our first year in practice one's time should be worth at least $2,000.00 yearly.

As we become more proficient through experience, naturally an advance in salary is justified and an increase of $250.00 per year for the first ten years should be considered as the minimum monetary expression of the advance in quality of our service to our patients.

In other words, in ten years' time a dentist should be worth $4,250.00 to his business. From that time on for the next five years, the increased valuation on services can be evidenced in longer figures.

In these successive years I suggest $500.00 per year, making the salary of fifteen years' practice and resultant experience

$6,750.00, for during the time between ten and twenty years of service, a man is at his best and after that he must take the downward path, as younger and more progressive men are going to lessen his valuation, because of their advanced knowledge, skill and activity.

These figures expressed, are the minimum only and yet how many men in practice today are drawing anything like these salaries from their business?

Conclusive to this let me say that the maximum salary we are to receive for our services must depend upon the individual man.

Subsequent to the group just discussed the next division of expense we must consider is our annual overhead burden. Burden means that part of expense which does not directly enter into actual production of your services.

The first three items, namely, *rent, telephone* and *laundry,* are self-explanatory, the amount of each generally being divided into monthly installments.

Miscellaneous office expenditures cover a multitude of dollars per year provided you do not overlook putting them on your expense list. A correct tabulation of these various items will surprise you as to the amount, and you will be gratified to see the results of your bookkeeping in the deduction of these legitimate expense items from your gross receipts in paying your income tax on your net income.

Up-keep and breakage entries in the cost budget, cover all expenditures aside from general depreciation for example, the repairing of handpieces, replacement of broken instruments, etc.

Printing and stationery bills for supplies of this kind amount to considerable each year and as stationery and billheads are a necessity in conducting our business, we must charge them in this division of expense. In this department do not omit to also charge your *postage* to the cost of service.

Journals and magazines are an adjunct to a well regulated office and those pertaining to dentistry are the recognized means of keeping well informed on all professional subjects and advancement relative to our calling. Don't forget to include them under burden expenses.

Dental society dues and clinics are costs incurred by our membership in different dental societies, together with the expense made necessary by attendance to clinics and meetings.

These expenses enter seriously into the cost of conducting our business for our one aim is to increase our skill and knowledge through such society membership and consequent attendance, that we may better serve our patients.

For this knowledge gained, they of course should pay the freight and we must enter it under burden expense.

Uniforms, gowns, linens, etc., are essential to the proper appearance of your assistant and for sanitary reasons, should be worn by yourself. Thus this cost of burden expense.

Taxes on our office furnishings and equipment are a burden of general expense.

Fire insurance has long since been decided by authorities as a necessary form of protection in all lines of business.

Liability insurance is a form of protection against mal-practice suits, to which we are always liable whether deserving or not and we can not ignore its importance as a protection, or in making a charge of the premium to our annual burden.

Health and accident insurance. This is the most logical line of insurance we can carry as it protects our income and our family when we are incapacitated. An accident might occur outside of the office but it might also be sickness or an infection contracted or received while working at the chair in operating.

Important also is the fact that there is economy in charging a premium of this kind to our annual burden in preference to deducting two weeks from our year's working time, the average time lost on account of sickness or accidental injury.

Commissions to attorneys are often made necessary expenditures during the course of our yearly collection of fees. Adjustments by compromise or suit through our attorney are the only means of taking this time consuming burden off our busy shoulders.

Uncollectible accounts. What one of us does not lose some of our fees in this class of accounts? And then again, who is going to foot this item of expense? We cannot deprive our family to the extent of extending charity to such patients that fail to settle for services rendered. It must be admitted, of course, that it shows lack of business ability in not collecting every dollar due, but even the largest mercantile houses with the best of credit systems have to charge a certain amount of their gross income to their expense in this connection.

The average loss during the years you have spent in practice is a fair and also the easiest way of determining the amount to be charged yearly to this item of burden.

Credit cost is an interest charge on the average monthly amount of our outstanding accounts. Little have we realized in the past, that it has actually cost us money to do a credit business. We cannot afford to settle for this out of our salary and must charge it to our patients in consideration for the favor granted. Business principles demand that we include this in our items of expense, and 6 per cent is the lawful rate to charge for this accommodation.

In considering *general depreciation* it may seem wrong to charge a straight percentage against the equipment of your establishment; for it is evident that some of your instruments and mechanical appliances must be used greatly in excess of others, so it would be almost impossible to arrive at a definite figure, as their life depends on their usage.

To simplify this detail, all instruments and appliances that have a shorter life than ten years are charged as you purchase them, to the previous item, upkeep and breakage. The balance of your invoice of standard equipment, with all due regard to advancement in style and conveniences, consideration of appearances and efficiency, should be usable and will not need to be replaced more than once in ten years, consequently 10 per cent can be accepted as a basis of percentage to determine our general depreciation of standard equipment.

The same rate of percentage should apply also to your invoice of supplies, provided you keep a complete stock on hand at all times during the year.

In the further item *new equipment* the individual tastes of the operator are factors to determine this amount each year. This item is to consider "new" equipment, not replacing worn out machines or appliances.

Charities, tickets and miscellaneous donations requested by our patients are obligations one cannot sidestep gracefully and are often means of ethically extending our professional affluence.

The human factor of direct productive and burden expense is an item that has heretofore escaped our notice. In looking over our past records, what per cent of perfection have we attained in our service operations. Our grades in college, if they averaged 90 per cent put us in the honor class; have we all been in the honor class? Have 90 per cent of our crowns, bridges, inlays, plates and so on down the list of our service, remained permanently satisfactory? If so, we are better men than the great majority: yet who is going to make good on these operations which on account of error due to the human factor are not successful? Who is going to bear the burden of our service guarantee? We may perform our part of the work without a fault, the impression, bite, selection of teeth and their articulation may have been without an error; in short, careful, conscientious attention is given every detail, yet something happens in the laboratory absolutely beyond our control and we must stand the loss of time, grin or swear, as the case may be, go ahead and make it over.

It has been estimated that 25 per cent of plate work has to be made over. Do our fees for such work take this matter into consideration?

The automobile manufacturers guarantee to make good any defects in material or lack of proper workmanship within a given time. Is this guarantee guess work? Indeed not. By careful figuring they realize that with a given number of cars sold a certain number are bound to be defective. Do they overlook this loss? No! Let me assure you that they have taken into account the human factor and that you have paid your share of the guarantee when the car was purchased.

Business men are not as sound asleep as we dentists. Now, then, have we not a right to expect each operation to carry a little more than the expenses already cited to make allowance for this human factor?

So, after taking for granted that we are in the honor class and that but 10 per cent of our operations need to be done over, we are bound to charge, at least an additional 10 per cent of our direct productive and burden expense to our service cost that we may protect ourselves against loss and keep our salary intact.

This percentage may deviate somewhat in a few of our burden expense items as it must be based on given amount of business.

These two groups of items having been duly discussed can now be considered as an actual cash outlay to conduct our business and may be footed up at the end of our business year and termed "The total cash cost of direct productive and burden expense." In addition to these two groups we have so termed costs, we must now also consider profits.

Fixed annual cost of profits must always cover excessive losses in order to balance our ledgers. There can be no definite definition of the term "Profits" for what would be termed profit in one line of business would be loss in another, but in consideration of this very important division, profits should comprehend and take care of interest, reimbursement and a definite realization on our investment made in our education and equipment.

In the correctness of the charging of *interest on our business investment* of *education* and *invoice* of *equipment,* there is no doubt and the legal rate of percentage is applicable. This item is often overlooked by our men in practice but what man in commercial business overlooks the realization of interest on his capital invested in computing his cost budget?

In charging 4 *per cent of our educational investment* which statistics show will average $3,000.00, we arrive at a means of retrieving $120.00 per year in installments on our original investment. Otherwise, unless we reclaimed this amount for 25 years, the average length of a dental practice, our investment itself would be a dead loss. This $120.00 per year for 25 years is a reimbursement or a retiring debt and replaces our original outlay of capital.

We have so far considered every angle of cost in conducting our practice, but let us not forget the importance of the growth and future expansion of our business which must be covered in this annual cost of profit. Consequently 10 *per cent of the total sum of our cost of production and burden* should be added as the final cost item to our annual budget as a provisional factor to assure a yearly business increase.

This is a legitimate procedure and adhered to religiously in the commercial world, so why should we dentists not follow suit and claim our just remunerative fee in its entirety?

After this systematic form of bookkeeping and condensed tabulation of the different divisions of expense we may now arrive at a definite conclusion of our total yearly cost of rendering dental service to our patients.

This *grand total* will represent the minimum amount your gross income should be to a profitable business and will be the means of ascertaining a fee in proportion to service rendered during the coming year and eliminate guess work in its determination. In this determination, however, we must also consider the amount of time we have available in our business year to earn this grand total of cost and profit. *Refer* again to the mimeograph copy and note the deduction from our calendar year of holidays and Sundays, half-holidays during the hot summer months, your vacation, which is a necessary recreation in order that you may be physically fit to render efficient service, also attendance at society meetings and clinics.

Our resultant deduction is that we may have a balance of only 245 available working days at eight hours per day, or 1,960 working hours in our business year. Now you all realize that this time allotted to office hours is not all available to productive service and accurately kept records of time lost each day during the past three years have proven to me that time consumed in:

Receiving and Dismissing Patients,
Tardy Appointments and Telephoning,
Examinations and Consultations,
Contracting and Adjustments,
Numerous Interruptions,
Attention to Correspondence, and the
Recording of Operations at end of each day's work will average 3¾ hours per day.

These hours are not remunerative and, multiplied by 245 working days, total 919 non-productive hours. By subtraction of these 919 non-productive hours from our 1,960 working hours, we determine the definite number of hours, 1,040 available to earn our total cost and profit. In consequence, by dividing our grand total of cost by our total productive hours, we determine the minimum fee an hour of our time should be valued at by ourselves, and also what it is worth to our patients.

This knowledge of a definite minimum cost of an hour's service will enable you to correctly estimate your fee in contracting and in naming the cost of service to your patients. However, you must also consider the average length of time it takes you to perform an operation of a given kind.

It will eliminate guessing at the amount of your fee or underbidding, so to speak, therefore every operation performed will be a profitable one to you as well as to your patient. It will enable you to name a *just* fee and you yourself will be convinced that you cannot sell service below cost. In this act of self-conviction you will convince your patient as well and benefit accordingly.

You will have a positive conception of what your minimum fee must be, instead of haphazard guess at about what the proper price should be on a given piece of work.

You won't arbitrarily name a fee in a guess according to your competitor's price, of your patient's ability of persuasion but will name it according to your definite "Law of Cost."

You should not be willing to take anyone's cost for granted but will need to find your own. Then if you wish, compare with your neighbor and if your fee is not in proportion to his, ascertain the trouble by checking up. Do not sell your service below cost merely because he is wrong in finding his costs.

In closing let me say that we have long worked to our financial detriment, but there is a remedy in sight, in form of the application of fresh ideas you may derive from thought on this subject of costs.

Only by an inflow of fresh thought can any business live and grow.

Each problem needs an idea—perhaps not new, possibly very old, but applied in a different way,—to help in its solution.

No matter how busy you are you can never afford to ignore fresh ideas that point out a better method or a more efficient system.

Today is the day of revolutionized knowledge in dentistry. With greater force than ever, is the fact brought home to the dental profession of the need of the direct specific information and its application to our daily duties.

So if your resultant ideas enable you to raise your income and overcome past losses overlooked, you will be benefited first and foremost.

ITEMS OF COST TO BE CONSIDERED IN RENDERING DENTAL SERVICE

Materials and Direct Productive Labor

Precious Metals ....
Teeth, Facings and Backings ....
Materials and Merchandise ....
Laboratory Bills ....
Power and Light ....

Gas
Assistant's Salary (⅓ productive time)
Salary
Total

Annual Overhead Burden

Rent
Telephone
Laundry
Assistant's Salary (⅔ non-productive time)
Miscellaneous Office Expenditures
Upkeep and Breakage (aside from General Depreciation
Printing and Stationery
Postage
Journals and Magazines
Dental Society Dues and Clinics
Uniforms, Gowns, Linens, etc
Taxes
Fire Insurance
Liability Insurance
Health and Accident Insurance
Commissions to Attorney for Collections
Uncollectable Accounts (average yearly loss)
Credit Cost—6 per cent interest on average monthly amount of outstanding accounts
General Depreciation (10 per cent annually on Invoice of Equipment)
New Equipment
Charities, Donations, Tickets, etc
Human Factor (10 per cent of Direct Productive and Burden Expense)
Total

Fixed Annual Cost of Profit

6 per cent Interest on Business Investment (Invoice and Education)
4 per cent Retiring Fund or Debt on Education Investment
10 per cent Profit on Direct Productive and Burden Cost for Yearly Increase
Total

Means of Determining Fee in Rendering Service

Number of Days in Year		365
Holidays and Sunday	58	
Half-Holidays	13	
Vacations	28	
Attendance of Society Meetings	21	
		120
Total Working Days		245
Office Hours: 8 a. m. to 5 p. m.		8
Total Working Hours in Year		1,960
Time consumed during Working Days		245

In

Receiving Patients,
Tardy Appointments,
Consultations,
Contracting,
Interruptions,
Correspondence
Dismissing Patients,
Telephoning,
Examinations,
Adjustments,
Recording Operations,
Etc., cause

Average Time Lost Per Day in Hours	3¾
Nonproductive Hours in Year	919
Working Hours in Year	1,960
Nonproductive Hours in Year	919
Productive hours in year	1,041

Grand Total Expense divided by number of total productive hours gives *Minimum* Fee per Hour to render service.

TREATMENT AND FILLING OF ROOT CANALS.*

BY FRED W. GETHRO, D. D. S., CHICAGO, ILLS.

In a review of the literature on the treatment and filling of root canals, one can find authority for following almost any method of procedure. This is just as true of the recent literature as it has been in the past. There is no other department of dentistry that offers as great a variety of expression among the profession as the treatment and filling of root canals. At one extreme we have many who have no hesitancy about destroying a pulp, no fear of failure in pulp removal and have abiding faith in their root filling, many not even feeling the need of the X-Ray to assist them. At the other extreme we have practitioners who are using the X-Ray films as their sole guide in making a diagnosis and are practically removing all pulpless teeth, and it is quite likely that in some instances they are sacrificing teeth with healthy pulps. We know that a great many of the light areas around root ends with live pulps are continually being incorrectly diagnosed as abscessed areas.

The practice of dentistry has always been, and probably always be, a series of waves, many of our members being carried away by the fads and fancies of the day. We are apt to accept these fads without sound reasoning. Some of the fads or waves of two years ago have disappeared and many of the fads of the present day will fall into disuse a year or two hence. It is quite unnecessary for me to recite any of these special fads, for most of you are familiar with their history.

No department of dentistry is of such momentous importance to both patient and operator as pulp treatment and root canal filling. This is not properly understood by the public and it is not fully appreciated by the profession. Our importance is much greater than most of us realize, our responsibilities are much more serious than most of us appreciate. If the dental profession could realize and appreciate the importance of this great responsibility it would revolutionize dentistry in the eyes of the whole world. How can this be accomplished?

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* Read before the Illinois State Dental Society, May, 1917.

gently without considering some of the causes of failures. Let us
It is impossible to discuss the subject of root treatment intelli-
sum up just a few of the most common errors in the treatment of teeth.

1. Lack of appreciation of the importance of pulp conservation. (Pulp should always be saved if possible).

2. Lack of appreciation of the many dangers incident to and following the removal of the pulp.

3. Lack of appreciation of the necessity of surgical cleanliness in every stage of pulp treatment. This means practically the same careful treatment for dead pulps, infected pulps, abscessed conditions, etc., as for a normal healthy pulp.

4. The dangers of injury to the involving tissues incident to the use of strong drugs.

5. Failure to make fillings during the treatment period that hermetically seal. (Lack of thorough currettement.)

6. Failure of the dentist to receive a fee worthy of this most important operation.

Can the profession be brought to realize that the pulp tissue within the tooth is not different from other tissues of the body as far as carrying infection is concerned? Can they be brought to realize that all procedures connected with pulp treatment should be performed with surgical cleanliness? Does any well informed dentist believe that even 50 per cent of the teeth under treatment today are being treated by a surgically clean method? One pertinent question is sufficient to cause us to think twice on this last question.

When the average operator places cotton which he has wound on a broach into a canal is it a sterile piece of cotton? Where did he get the cotton and how did he wind it on the broach? The great percentage of operators will take cotton from an open cotton receptacle that stands on the tray week in and week out. This same cotton is the supply base for almost all operations. It is usually wound between fingers that are anything but sterile. I could continue at length on these and similar points but I know it is not necessary. The point that I want to make right here is this—Get away from the idea that you are only removing a nerve. Get your patients away from the idea that you are only removing a nerve. Educate them to know that the proper removal of a pulp is a surgical procedure and is subject to the same laws, the same dangers that surgical interference in the other tissues involve, namely blood poisoning. If patients only knew the dangers they are continually being exposed to, do you believe they would permit these careless operations?

The present tendency among the leading surgeons of the day with the exception of the surgery on the European battlefields is to discard the use of antiseptics of any kind within the tissue. This is a complete reversal of the practice of many years. It is true that the use of antiseptics inhibits bacterial growth but it also inhibits nature from making a normal repair. The present tendencies of many of the dental profession is to continue in the use of strong medicine within the tissues. I give way to no man in my zeal for strict surgical cleanliness in every detail pertaining to root canal treatment, and I realize that the agents frequently used will very quickly destroy bacteria, but many times they do exactly what we do not want them to do—they inhibit the normal repair of the investing tissue or they destroy it. A rule that I should always apply would be this—never use anything in the treatment of a root canal that can possibly injure the delicate tissues at the end of the root. It is unnecessary—it is unwise—it is dangerous.

I do not use arsenic for pulp destruction because I am convinced that many times the arsenic is responsible for the injury to the investing tissue. I am satisfied that arsenic in the hands of careful and skillful men may be used under certain prescribed conditions without much danger, yet I recognize that it is a dangerous drug and I do not use it because it is dangerous and because I want to recommend its disuse. A loaded revolver may be safely used by some men but when it will serve the same purpose in less skillful hands without being loaded, why run the chance. There are so many other methods of pulp removal that it is quite unnecessary to use this powerful drug.

We have inherited much wisdom from those of our profession who have blazed the way for us and I am always ready to take off my hat to them, but we also have inherited things that were built on false premises and it is a very difficult thing to get away from such long established methods of practice. One of the hardest things for many of the profession to get away from is the erroneous method of long continued treatment of pulp canals. I maintain that practically all root canal treatment (regardless of the condition—regardless of complication), should be completed within two or three treatments, and very frequently this whole procedure can be completed within a few days. The extended treatments covering a long period of time are detrimental rather than beneficial.

I know this is quite contrary to the usual custom and I will recite the history of one case to show you how this is put into practice. I recognize that the history of even quite a number of cases does not prove anything. It requires a great number of cases to prove the merit of correctness. In going over this same subject recently before a post-graduate class, I proposed to carry out the method in a clinic. Accordingly a student was brought in with infected pulps and an abscessed condition on both lower central incisors. You will readily admit that this is about as bad a condition as we usually find. Briefly the method pursued was this: After the teeth were cleaned the rubber dam was placed and the field sterilized. The infected pulps were carefully removed, a little at a time—first with small broaches removing about two millimeters of pulp, then taking a larger sized broach enlarging the opening of the canals by curettement. A most important thing is to have an effective and clean method of keeping the barbed broach free from debris. How well do we remember the old brush on the head of the foot engine that was always used for cleaning everything—broaches, burs and what not, but never sterilized. Have we a good, effective method of cleaning broaches at the chair today? I know of no better method than the all-brass brush made from small wire, one that can be sterilized easily by boiling, etc.

The continuous cleaning and sterilization of the broaches as well as every other instrument that enters the canal is of the utmost importance. This process of pulp removal was continued until only a small remnant of pulp remained, and yet we had a very accessible canal, made so by the currettement method. I knew that I had only a small amount of pulp remaining by measurements made on the films. The small remaining amount of pulp was then removed through a clean, accessible canal and the cavity hermetically sealed with as good a gutta percha stopping as I could place. Before placing the gutta percha the cavities were thoroughly cleaned with alcohol and then moistened with eucalyptol so that the filling would adhere closely to the cavity walls. The one great difficulty with a well-placed gutta percha filling is that it is hard to remove at a subsequent appointment. This treatment was placed on a Thursday and I predicted that the tooth would give no trouble and would be in perfect condition for filling on the following Saturday. On the following Saturday the pulp canals were in good condition and were filled without any complication of any kind. Later the ends of the roots were removed and the case is progressing favorably. Pictures were taken at every step of the operation to check up on the conditions.

There seems to be a well-grounded opinion that root measurements taken from films are very uncertain and usually unreliable. I have always believed quite the opposite. In order to have satisfactory and definite reasons for the dependence I place on the films, I have made a number of accurate records (almost 100). In every case during the past year where I had X-Ray films and I was to remove a tooth, a root, a crown with metal posts, or a post that was used for retaining filling, or, in a few cases, pieces of broken broach, I have always made accurate measurements on the films, made a definite record of these measurements, and then compared the actual measurement after the root, tooth or whatever was removed, and I am able to report that more than 90 per cent are absolutely accurate. I selected at random about a dozen of the cases that I have recorded and they are here for your inspection.

There is no denying that films may be made showing great distortion, but it has not been my experience to have may such films. All of the lower teeth can be accurately measured, and most of the upper teeth, with the exception of upper molars (and I only except a certain percentage of those). We may get pictures showing length of roots that are very accurate. One of the specimens that will be referred to is a film of an upper first molar and our measurements before the tooth was removed were absolutely verified by the extracted tooth. When the roots of the first or second molar are spread widely apart and the rays are at a bad angle, we will get a film very much distorted. The few exceptions do not alter the fact that most films can be made to accurately register the length of the roots.

This is a valuable asset in the treatment of root canals and should be used by every practitioner who desires to render the best professional service. To fail to make use of this most important help because a very small percentage of the films will be distorted (and these always limited to a few of the upper teeth), is about as good reasoning as the operator who fails to attempt to make any good root filling because a few teeth have badly curved roots which preclude the possibility of thorough root filling. It is folly to hide behind the statement that some roots are so crooked that no operator can successfully fill them. Only a very small percentage of the roots we are called upon to treat have badly curved roots and can be placed in the doubtful class.

I cannot believe that it is as much as three percent, most all of the badly curved roots that we have seen or know about are in extracted teeth, and I venture the opinion that most of these were in teeth extracted for other reasons than failure in treatment. If the points made about root measurements are correct they will stand the same test and be of the same value in root canal measurement for treating and filling root canals.

I have said little about the value of the X-Ray in the diagnosis and treatment of root canals, because I desire to keep this paper enthusiastic about the value of the X-Ray films. The more I learn within a time limit. Most of you know that I have always been and the more I study these pictures, the more I realize that they are invaluable. Many mistakes are being made but they are usually made because the interpretation of the film was incorrect. Films require study. Many men of average ability will make snap diagnosis on a poor picture, so poor that an expert would not even venture an opinion. In passing, let me say that films will very frequently show us beginning of caries on parts of the teeth that would escape the most careful examination with instruments.

In conclusion, let me briefly summarize:

1. Save pulps. A tooth with a healthy live pulp is insurance against future trouble.

2. All treatment should be carried out under surgically clean methods.

3. No strong medicines should ever be used in root canals.

4. All small canals should be enlarged by the currettement process. (Barbed broaches.)

5. No instrument of any nature should ever go through the foramen.

6. Hermetically seal every treatment.

7. Remove the pulp—you cannot remove the nerve: Nerve is incorrect.

8. Do your operation thoroughly and finish as soon as possible. Never delay treatments. It is the most important service rendered by dentists.

9. Appreciate the service rendered. Get a fee worthy of the operation.

BUSINESS LAWS IN THE PRACTICE OF DENTISTRY.*

BY JOHN L. KIRBY, D. D. S., CHICAGO, ILL.

Law is universal. God moves in a mysterious way but always according to law. Haphazard methods of action are not in harmony with an all-wise creator. The harmony of the universe is the result of law. Control of giant forces is possible only by adherence to the laws that govern those forces and which are not dependent on the whims or beliefs or caprices of some one person.

Physics, chemistry, music, all sciences and arts are governed by laws that are inevitable and operate the same regardless of province, climate or race. Disobedience to man-made laws brings punishment depending on the executive in charge at the time of their violation. This is not so with the laws of the universe. Violation of them has its punishments; compliance with them has its reward. No favorites are played. In the practice of dentistry there is a department of business controlled by the laws of the commercial world that operate in as positive a manner in their sphere of action as do the laws of chemistry in the combining of elements, or Ohm's law in the resistance of electric energy, or Newton's law of gravitation in regard to falling bodies.

Creed, race, climate, geography have no bearing on these laws, either commercial or scientific. We treat lesions of the tissues and predict success in accordance to the degree that we work in harmony with the laws of physiology in regard to the living cell. Inlays, bridges, dentures and all mechanical restorations will stand or be destroyed as we have adhered to or violated the laws of mechanics.

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* Read before the Illinois State Dental Society May, 1917.

The impossible is the attempt that is contrary to law. Not the failure due to technique or poor skill. Success is due to adherence to the law whether that law is recognized or not as being responsible. The laws of gravitation have always acted the same on the rock and on the feather.

The wizard of the commercial world understands the workings of the laws that control the commercial world and adheres to their tenets. Among the results desired in the business world is a profit, a surplus, stability, increased earnings, power, good-will and growth.

Every business house whether it is a privately owned company or a corporation, has one activity only, they barter a commodity. That commodity, regardless of its form, invariably represents a service in some form. Transportation, telephone, manufacturing, mining or farming all represent service. The following is a law of the commercial world in regard to profits. When a product is bought to be resold the selling price must be greatetr than the purchase price and enough greater to cover the additional cost of making the sale.

A dentist, from the commercial angle, has only one product to sell—that is service. If he wants to earn a reward above what it cost him to deliver that service he must sell it for more than its cost to him. Otherwise he is violating a fundamental law of the business world. That law acts as definitely as the law of definite proportions in chemistry. Walk into any successful business house today and one of the first proud boasts of the manager is what he knows about his costs of doing business. He displays his cost sheets and his cost system. He can tell you to a penny what it cost to produce or sell this item or that; he *knows*, and if he does not know he soon loses his job.

Another of the laws of the commercial world is that the cost of doing business must be known as an absolute essential to the successful conduct of that business. Even if the profits are excessive, *knowledge of cost* is more important than the surplus or excessive profit. One curse of a dentist's business activities today is the lack of knowledge of his costs.

The average professional man lives beyond his means very often because he deludes himself about his earning power. His gross is mistaken for his net, and his net is unknowable because his cost of doing business is not known. He cannot save because he has nothing beyond his expense account from which to draw.

Another law of the commercial world is to make every sale profit bearing; this is not always possible. However, if one sale is made at a loss another or many other sales must be made at a profit to break even. This involves useless activity and cost systems are developed to stop this very thing. Every service the dentist sells ought to be under the same law. Each sale being self-supporting.

The tissues of the mouth are subject to the same physiological and pathological laws as are the tissues of any other part of the body. The business activities of the dentist are subject to the same laws as are the business activities of the banker or merchant.

The business man today will tell you that the simple knowledge of the gross receipts and gross expenditures are not sufficient knowledge on which to conduct a business safely, and that detail knowledge must be had. That the business must be analyzed and departmentized; that one department must not be a drag on another. That every business has needs peculiar to itself and those needs and demands must be met accordingly.

For example, the farmer quits work for the day, but his crops work while he sleeps, his land increases in value as the productivity of the soil develops; time with him becomes a matter of seasons and not days or hours; because of the enormous loss of a season's earning power, intensive power of the soil is studied, insurance against crop failure is purchased.

The railroad makes its earnings from the tonnage of a car or the speed of moving a given amount of freight a mile. The manufacturer earns according to the output of his machines plus the efficiency of his mechanics, plus the education of the public for his product. A salesman earns according to the number of hours out of the twenty-four he can efficiently offer his merchandise to the prospective buyer; the telephone company to the number of messages that can be transmitted in a given amount of time on a minimum of equipment. In all these conditions you will find the factor of time playing a very important part. With the dentist his earning power is based entirely upon his time. When the office closes his earnings stop. His earning power is intermittent even when in his office. This earning time has been called productive time.

It is the time spent at the chair or bench doing a service for which a fee may be collected. The average man rarely exceeds 50 per cent of his office time as productive time. This statement will not be believed by anyone who has not kept a record.

The farmer dreams of intensive farming, the dentist dreams of making two crowns in the time of one and doing it as well. The railroad fights the expense account due to wrecks, short hours of employes, depreciation of equipment, luxury demanded by the public, all by increasing the freight rates. The dentist is trying to do business on the *fees of twenty years ago* with a more luxurious office, multiplied equipment, more expensive make overs, greater depreciation, and higher living expenses.

The successful salesman studies the psychology of his prospect and the laws of selling. The dentist should have a more salesmanlike method of presenting his services and a more businesslike method of getting them accepted and paid for. The telephone people have reduced their earning ability to a question of minutes and hours in the 24, using expedients to cover slack hours and encouraging messages away from the rush hours, thereby holding their equipment to an average of service. The dentist's earning ability is absolutely reduced to a specified number of hours per year. From 40 to 75 per cent only of his time in his office is productive in cash returns, regardless of his patronage. If the sale of his services is so limited all the more should his activities be run according to definite business laws and not by a haphazard, unsystematic guess. The impossible is no more possible with the dentist than with the banker.

We see the laws of the commercial world forceful, compelling and immutable, governing the business activities of a professional practice as surely as do the laws of chemistry and physiology govern the activities of the living cell. A brick dropped from the top of a 20-story building falls according to the laws of gravitation, and he who gets hit by it gets hurt. Laws of the universe know no favorites; they are inflexible, immutable and dependable, and violators get hurt when hit.

In that part of the dentist's work that has to do with the business laws let the laws of business have full control. Let sentiment die and haphazard methods cease and charity be dispensed in a more business-like manner.

I offer the following practical suggestions for adherence to the laws of the commercial world.

First. Quit guessing about the data of your office, and collect accurate figures on the same. No business house runs on his neighbor's figures.

Second. The methods of the successful business man have the respect of all classes of society from the lowest to the highest. The business methods of the professional man do not enjoy this prestige. Adopt methods of the successful business world.

Third. Things are accomplished in a professional way only when you have the money. A financially successful dentist should be a better professional man and usually is. Save systematically.

Fourth. It requires a little effort to collect information about your business, but it always pays a much bigger dividend than gold mines or rubber stock. Keep data about the office that will inform.

Fifth. Most every kind of commercial activity is getting good business help from others in the same lines. The professional man is either so jealous or ignorant that he steadfastly refuses to disgorge to his neighbor any data that is of any value. Compare with another.

Sixth. Because of a peculiar disposition to be in a hurry the dentist demands his supplies be handed to him in the most expensive and extravagant manner. Be more reasonable with the Supply House.

Seventh. Because he is a poor business risk he too often pays a usurious rate of profit for his supply service. Check up buying at the office as at home.

Eighth. One-half hour every day spent at the desk will bring more organization and system into the business part of the office and consequently more money than three extra hours spent at the chair.

Ninth. Health is worth more than business. Eliminate nerves.

Tenth. A love of your calling is in a *direct* ratio to the net income of your office. Make the office pay and love will follow.

Eleventh. That every activity in the business world is granted the right of making a fair profit on a transaction, to say nothing of obtaining the original cost of the service sold. Add a profit above the cost.

The following suggestions have been found helpful: Spend thirty minutes a day at your desk for six weeks, analyzing *your* problem, keeping out every one except your office assistant; second, classify your operations in a group, ascertaining what each group has brought in cash, and the average on each operation. Ascertain what proportion of your producing time has been spent on each group of operations; fourth, compare the time spent on each group to the amount received from each group; fifth, analyze your gross yearly time spent in the hours on the production of cash to your gross yearly expense in maintaining the office and the necessary drawing account for the home needs; sixth, see that every hour spent at the chair brings a return equal at least your average hourly expense.

For example, the average hourly expense, we will say, is $5.00. The time spent at the chair is six hours. At least $30 must be brought into the assets of the office every day to meet the expenses of the office. Greater or less hourly charges may be made.

Seventh, keep accurate account of time spent in cash production in order to learn how much waste time you have; eighth, realize that your earning ability is limited first by the number of hours possible to spend at the chair, second by the size of the fee obtained by rendering the service, that the cost to you should be the minimum to the patient; the maximum whatever you and the patient can agree upon; the courts will allow you only what is customary for that particular service; ninth, estimates in advance are businesslike, possible and help to avoid quarrels in the final settlement. Such estimates can only be given intelligently by a dentist who has collected data on his cost that is reliable. Tenth, estimates should give the number of hours required for the operation and the amount of expense to the patient, with a surplus added for safety to the dentist. Eleventh, other dentists should have access to all figures (barring private information), that will help the entire profession to a more sensible fee basis than is at present in use. Twelfth, money drawn from the business for necessary family needs is a part of the expense of conducting the business, as the head of every business house draws an income from the business sufficient to live upon and such salary is charged to the overhead. The overhead expense includes the depreciation of equipment, depreciation of the operator, plus all the supplies and incidentals, together with a reasonable salary to yourself.

Fourteenth, the knowledge of faulty business methods must be backed with courageous action to change the precedents of the office, otherwise ignorant bliss is all that is needed. This means that operations performed for less than they cost the dentist must bring in a higher fee or be banished from the list of services rendered. Fifteenth, *collections, allowing credits, buying supplies, refurnishing an office, taking out money for your own salary, maintaining an equilibrium between the income and the expense,* requires the cold, calculating mental state of a banker.

In conclusion, let me make it plain that I am not here to tell anyone how to run his business. I do not offer myself as a horrible example or the opposite. After studying the business end of the dental office for a number of years, I see no reason why the laws of the commercial world should not be applied in a dental office exactly the same as in any commercial institution. If such laws are applied intelligently they will bring the same results that the intelligent application of law will bring in any department of life. Render unto Caesar the things that are Caesar's and unto God the things that belong to God. I have nothing to sell. If any man is anxious to learn, any print shop nowadays can teach him a cost system. Any banker can teach him a safe system of giving credit; any merchant can teach him a good system for the collection of accounts; any successful business man can tell him about the overhead and the ratio between income and expense; any successful house on any street, in any town, can prove to him the demands of the public today in regard to location, equipment, and standard of upkeep. The demands of the public are different than they were twenty years ago. Any contractor or architect can teach him how to make an estimate before he renders the service and how to make a contract for doing the same. The business side of dentistry demands attention to the laws of the business world. Not the adoption of a lot of insincere "bunk" that disgusts sensible people and brings disrepute to the profession as a whole.

ESTIMATES.*

BY Y. E. WHITMORE, D. D. S., LITTLE ROCK, ARK.

My paper on estimates I will try to make as short as possible, yet long enough to cover the subject to the best of my ability. It is the logical thing for a patient to say, "Doctor, what will be the cost of this work? How long will it last? How much do you charge for a filling. They consider all work alike in size and in time it takes to prepare the cavity, or to restore the lost or affected parts, or anything you might undertake. The people even want estimates over the telephone, and they are not to blame. The dentists are to blame for letting anyone talk about an estimate or encouraging a suggestion along the estimate line.

Previous to the time a dentist opens his office he has done nothing but go to school, and I claim that it takes more than a high school and college education combined to hold one's own with a public that is constantly looking for the best of it at the very lowest estimate possible; and when we open our offices it might well be said our trouble begins, as I know of no Dental College that teaches the business side of dentistry to the extent of carrying on a very small practice successfully. In fact, the dental depots have more to say about the business side of dentistry than do the colleges at this time.

Most of us are in such straightened circumstances at the beginning of our practice that we can scarcely afford to see anyone leave our office, with the result that they generally get what they want at their own fee. A lady came into my office with a highly inflamed gum from a badly fitting gold crown. After the crown had been removed she fussed about the dentist who made the crown and said, "I just paid him $5.00 for that crown three weeks ago." Upon inquiry I found that she would not have had anything else. She would not permit the pulp to be killed and the root canals filled, and would not pay more than $5.00 when the dentist's fee was $10.00. She seemed to think that her judgment on what she needed and on the fee was a rare gift of hers. In this case the dentist was decidedly to blame, as the tooth only needed a filling in the occlusal surface, and the patient seemed pleased after it was inserted.

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* Read before the Arkansas State Dental Society.

What chance have we in an argument on estimates? When they say to you, "Doctor, I would like to have my teeth fixed, but I must know how much it will be, as I never go into anything without knowing what I am doing," or "Doctor So-and-So always told me to the cent what his work would amount to. The groceryman, druggist, or drygoods man all tell me what the prices will be, and I must know or I cannot have the work done." They even tell you that the surgeon can tell within a few dollars of how much an operation will be. They put their wants low and when you give them an estimate their wants go up, and usually high up.

Did you ever have a patient, a nice agreeable one, on whom you have just completed a nice piece of work and attached a fair-to-low or medium estimate say, "Why, Doctor, you said that your fee would be so-and-so," and if it has been a rule to give estimates, you do not know what you have said. You like your patient, you want to hold him. You think quick and fast, and he thinks just as fast. You are between the devil and the deep blue sea. Your nice patient stands to slip out of from $1.00 to $50.00. Then you are in a position to say positively, "I never give estimates." We have all had this sort of thing to contend with, and I ask you to weigh it again and again.

There are many reasons why we cannot give an estimate. Some patients will let you work without interruption, others will not let you work at all and the conditions seem the same. You cannot tell the extent of the decay, the state the pulp is in, or how the pulp will yield to treatment or whether the canals are open or constricted. I believe I could add fifteen or twenty other reasons from the standpoint of the teeth alone as to why we are prevented from giving an estimate, to say nothing about the temperament of the patient, which is a big factor. Of course, we can put the estimate so high that we would be more than safe, but this is also very undesirable. We often get a type which appears perfectly calm, but they are not, and *vice versa*. Then, a great deal of the trouble comes from the fact that the dentists are not honest with their patients. Some of them offer for their reason for a certain charge that the gold amounts to $9.00 and they get $10.00 for the work. I have had patients try to get credit for the gold, in fact, the dentist who gives estimates or talks about the fee is in more or less trouble all the time. I speak from experience. If the patient has confidence in you as a dentist and as a man, the amount of fee should never enter. You should be so busy trying to help the suffering, that to estimate what the charges will be is distinctly out of place. If the patient thinks that you are going to hold him up, why did he call at all?—or is he trying to hold the dentist up?

When your prospective patient comes in with the estimate idea uppermost in his mind, it seems as if he wants it more than he wants relief. They tell you their little story about what Dr. Jones or Brown has offered to do their work for. At this time you must not forget that the people are just as likely to falsify as they are to tell the truth. Another good practice is to forget that there is another dentist in town, in short, practice always as if you had no competition at all. Sometimes you will find a dentist whom you like. You also have a great deal of respect for him as a practitioner, but you are at a loss to understand why he charges less for some of his work to certain people than you would have charged. It is not that he wants to get under your charges. Not at all, but it is his honest judgment about the worth of the work combined with the ability of the patient to pay.

What show has the average dentist with the business man whose life has been spent in buying, whose arguments on the price of things surpass the entire knowledge of the average man in our profession? As an example of this, I knew a young lady, a country girl, who deserved consideration though poor;—the family of nine adults living on eleven acres of land. She had lost her upper centrals and laterals, an ideal place for a bridge. Her finances, as you will note, were limited. I could not do this work on account of being rushed, so I turned her over to a dentist whom I knew was not busy, telling him her history and that four or five dollars a tooth would be a good estimate. He afterwards told me that he had made her an estimate of fifteen dollars a tooth. He might as well have given an estimate of $75.00 or $100.00 a tooth. A short time after that the Doctor showed me a fourteen-tooth bridge at $5.00 a tooth that he made for a gentleman who owned the Dardanelle & Ola Railroad. What happened in this case? The gentleman outtalked him.

Why can we not give an estimate as well as the surgeon? At St. Vincent's Infirmary a short time ago, I saw three surgeons operate, one for tonsils and adenoids, the others for uretro-vaginal fistula, and for recto-vaginal fistula. What were the circumstances? The three patients were under a general anesthetic and the surgeons did as they thought best. There was no interference whatever on the part of the patient; and no doubt when the estimate was given by them, if they gave one at all, they had only the operation in mind and not the patient. Had they to operate as we do, they would never have accomplished anything.

The most desirable practices today are with the class of people who want the best that can be done for them and are willing to pay for it. Of course, we should in a large measure take the ability of the patient to pay into consideration, and lots of the work that we lose on account of estimates, going to the advertisers, we would get had we an opportunity to study the patient then as we do while doing their dentistry. We would make friends and render a service that is pleasing to the patient, to ourselves and a help to the profession ethically, if we were only able to keep the estimate entirely out.

A lady came to my office in whose tooth I inserted a medium size amalgam filling. The operation cost her $24.00. Her husband came to me afterward and in his mouth I inserted three amalgam fillings and cleaned his teeth for $10.00. Any one of the fillings that I put in his mouth was as large as the filling that I inserted in his wife's mouth. The reason her operation was so expensive was that she positively would not let me prepare the cavity. I used every known desensitizing agent with a sharp bur and steady hand, and still she failed to hold still. I finally told her that I would insert a temporary filling and possibly she could find some dentist that would be able to put a filling in her mouth on the jump. This made her very angry, but she held still so that I could insert the filling. I did not charge her $24.00 for the filling, but for the time it consumed to insert it. I explained this affair to her husband and he said of course the bad part of it was that he had to pay the bill, but that he would not go through what I did for twice the amount.

Then again some will give a patient an estimate on cleansing the teeth. I mean by that, to brush the teeth with one of these little rubber cups or bristle brushes. They give an estimate of $1.00 for this class of work, which usually is an excessive estimate. The patient then goes to another dentist who examines the mouth carefully and finds a great deal of calculus around the teeth and under the gums. The dentist is not sure of the depth of the deposits on the roots of the teeth. He is honest with his patient when he tells him that he doesn't know how much it will cost him to clean his teeth. He has in mind a thoroughly prophylactic cleansing. The patient says, "Doctor, will it be more than $1.00?" "It most certainly will be." The patient has no way of ascertaining what either dentist had in mind to do, and I think the dentist who insists on doing his work correctly and getting a fee for it, is doing three things better than the fellow who does not care what he does just so long as he gets his dollar. The first of these is the service that he renders humanity; the second, the service that he renders the profession, and the third is the satisfaction to himself.

I know of no other illustration that I can bring to bear at this time that would further my argument against an estimate than to say that the dentists who get the real sunshine out of life, especially out of our professional life, are the men who do not allow their patients to bring up the subject of "How Much," and it should be a law or an agreement mutually understood by all ethical dentists that the fees should never be discussed in this way at all, and of course it is understood that the dentist is to have good and sufficient reason for charges when he makes them. I mean by that, that he should be honest with his patient and with himself.

Another point that I have just brought out I fear that you might overlook. I have just said "ethical" dentist. The unethical fellow is always a thorn in our side, but by refraining from the estimate game you leave those fellows all by themselves. It is rather a nice thing to say to your would-be patient, "No, thank you, the subject of fee never enters my practice until after I have completed a part or all of my work, but the gentleman who gives you his fees in the daily paper and on signs around his office can tell you to a cent what your work will amount to. He can also put your mouth in a worse shape than it is in at this time." Then, if they want to know, you have only to tell them the truth, saying that they will do work for you that you will think is all right, but which I have rarely observed ever gives any satisfaction. It also is a practice of these gentlemen to raise the prices of their original estimates. By this little argument you make it harder for them, and at the same time you elevate yourself far above them, and this should be our aim always.

I have tried to hold this paper strictly on estimates. I ask you to think about it and you will realize that it enters into most everything we touch in our profession. If you approach the subject of "estimate," you find ethics with all its professional relations staring you squarely in the eye. However, you will be surprised as to how quickly you can get away from the estimate game and all of its attending evils if you are persistent, but if you listen to their smooth tongued arguments, they will throw you as surely as fate. I thank you.

PRESIDENT'S ADDRESS.*

BY L. A. MEYER, D. D. S., OCONOMOWOC, WIS.

Members of the Wisconsin State Dental Society, Ladies and Gentlemen:

We feel very grateful for the warm-hearted invitation extended to us by his honor the mayor of this beautiful city of Janesville, and in return for this generous hospitality extended, obligate ourselves to such deportment as will cause our host to say when all is over, "Come again."

This, the forty-seventh annual meeting of the Wisconsin State Dental Society, is but another page in the history of the society's records, and can only be measured by comparison with others of the past; leaving you to judge if the society is accomplishing all that was intended by its founders, namely, to cultivate the science and art of dentistry, and all its collateral branches; to elevate and sustain the professional character of dentists, and to promote among them mutual improvement, social intercourse and good will. Your presence here today is significant of the fact that you are interested in all that is good for the dental profession, and it is gratifying to note this thirst for accurate knowledge, and the willing sacrifices made by many of you each year to obtain it. Where? At just such meetings as this one. Due to the splendid work of the various committees, there has come together a great showing of all that is up to date in the dental and its allied professions for you to enjoy and take with you such mental and material stock that will better enable you to perform the duties you owe to yourself and the community that you serve.

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*Read before the Wisconsin State Dental Society, 1917.

The literary and clinical program for this meeting is intended to set forth some of the progressive ideas and methods in the practice of dentistry today, and I hope there will be something in either the papers or clinics that will interest you.

As president of this society it is my pleasure and privilege to call your attention to work in furthering the growth of this society, and the advancement of our profession as well as to recommend to you certain measures which would seem to lead to still greater progress.

DENTAL SOCIETY.

Believing that the effectiveness of any organization depends upon its individuals, it is up to each one of us to answer the question, "What have I done to further the interests of my component State or National Societies?" Furthermore, "Can I conscientiously state that I have attended to all such implied duties?" If so, this would indeed be a splendid atmosphere to live in and a wonderful age of progress to the members of the dental profession. But, alas, how indifferent many of us are to the appeals from our local and state secretaries. When requested to pay your dues at the stated time, or to do some special work for the society, I believe that you would appreciate the work your elected officers are doing more should it be your good fortune to exchange places for a time. Now the answer to all this lies in the co-operative work for a common benefit to ourselves and the profession at large.

Recognizing the worth of the component societies to the State Society, every effort should be put forth by the president and secretary of this society to establish county or district components. This year, two component societies were organized, namely, Sheboygan County Dental Society and Columbia-Dodge County Dental Society, both doing nicely. Request is now pending for a visit to the members of Jefferson county with a view of organizing a component society. I mention this fact to show that some one must be interested to spend his time to give these new localities necessary information for a proper start.

The executive council voted $50.00 to spend in such extension work this year under direction of your president, and approximately one-half of this amount has been expended. I believe it a good plan to continue such a fund, and experience will show good results in the future. As you will note on page 13 of the *Bulletin*, there are now sixteen component societies in good working order. At this moment I wish to express my appreciation and thanks to those members of the medical and dental professions who have so kindly assisted in the programs of the various component societies this year.

Since many of us are simply taking the attitude of a sponge, absorbing everything that comes our way, I would suggest the willingness to pay for such values received. At this session there will be an amendment offered to our constitution, providing for substantial support to the Research Institute of the National Dental Association by sending one dollar ($1.00) per year for each member of this society. Such measure when presented should have your hearty support. Other state societies have done this and expect Wisconsin State Dental Society to be in the accredited list for doing things.

I wish to add that Dr. Babcock was unable to be here, but if he were here he would favor the amendment for the additional $1.00 for the Research Fund. I want the members to express themselves fully. Personally I am in favor of it, if you approve the change let us add that $1.00 to our dues and stick to it. Discuss the matter fully here in the meeting and if it is carried, well and good, pay your money. I am sure you will receive your money's worth many times over.

I have often thought and tried to give an answer to the question, "Why does such self-satisfied feeling exist among the young graduates particularly, and among many of the apparently reputable dentists in this and other states?" I can give but one answer at present and that is that we act charitable toward such members of our profession with the hope that some day they will awaken to their true professional duty, and be grateful for our patience and forbearance with them. I believe that our dental colleges could do much to alleviate this lack of interest of the young graduate by proper teaching with this end in view, that instead of leaving his Alma-Mater to make a fortune, which seems to be the uppermost thought in his or her mind, he is going out to be a servant of his fellowman and to help solve the different problems that always confront our profession.

PROGRESS IN DENTISTRY.

A great orator has said, "Not one person in ten thousand is a thinker." Have we been educated wrongly? Stop and think of what we are doing, let us change our present methods of tinkering with the teeth to the application of prophylactics in our profession.

Professor W. D. Miller of Berlin showed us thirty years ago that lactic acid germs were the cause of tooth decay and no one has since disputed his claim. Why then have we not used proper germicides to destroy the germs of tooth decay, and other pathologic germs in the mouth which are dangerous to the health? I believe that our profession is now thinking very seriously. For, we have the oral hygienists and pathologists busily at work teaching the public how to prevent rather than cure disease. By this method only can we hope to hold up our heads and claim an honorable position with other departments of the healing art. Years ago it was said that a bright mind would pick up all that there was in dentistry in a few months, but in the intervening years, however, the world of dentistry has been moving around at a swift pace, and the man who has not kept abreast is like the householder who expects the key of his old flat to fit his new home. He can't get in. In such conditions opportunity changes her password every day, information quickly becomes obsolete, while methods and materials are quickly discarded.

There are approximately 45,000 dentists in the United States, one to every 2,300 people. Fifty-two dental colleges are turning out 3,000 graduates each year. From these facts, it is self-evident, that no dentist, be he ever so proficient, can well afford to neglect advantages offered for betterment. No man can swim up Niagara Falls and no dentist can be untouched by the progressive movements of his profession and hope to remain in practice. Quoting Kaufman, "Get away from the big mob of little men and come on up. Competition is intense down below. There is nothing but room overhead."

The public is just beginning to appreciate the importance of scientific dentistry and the relation of the good dentist to the conservation of the public health. Dentistry as a science is still in its infancy, therefore, leading dental educators have recognized the necessity of strengthening the curriculum in dental colleges.

The dental college is the early formative period of a dentist's professional life which needs to be carried forward to greater heights by dental society instruction. In other words, the dental societies of today are the post-graduate schools of dentistry. With the growth and importance of dentistry there has grown to be a demand for higher instruction and to furnish this to the masses of the profession should be the principal mission of the dental societies of today. So it would seem, that in view of things confronting us, that this State Dental Society could be of no greater service to its members than to provide real and definite post-graduate instruction by authorative teachers even though such instruction must be in short courses as yet.

STATE BULLETIN.

You have received but one issue of the Wisconsin State *Bulletin* this year, but no apology seems necessary when we consider the quality of that issue. I am sure this society is proud of the splendid efforts and results of its present editor, Dr. Roy Hopkinson. This society is in the front ranks and should, therefore, have and maintain a publication of its own, wherein free expression of thought, valuable announcements and educational matter along professional lines can be conveyed to you, making it well worth the energy of its editor and your reading. As previously suggested, there should be associate editors appointed from the various sections of the State, and I believe that the secretaries of the component societies should be so appointed. In making such appointments it would give each component society direct interest in the issues of the *Bulletin.*

HOLBROOK MEMORIAL.

Just one year ago this society received the following telegram: "Dr. O. G. Krause, President and Members of the Wisconsin State Dental Society, Wausau, Wis. Most hearty greeting from a Charter Member who regrets he cannot be with you and who sends his best wishes to each and every member. Signed, Arthur Holbrook."

How good it would make us feel to again have his greetings.

But alas he has answered his last call. Dr. Holbrook's pioneer work for this society is most deserving, and I suggest that a committee be appointed to draw suitable resolutions to be spread upon the minutes of this society, and a copy sent to his family.

I am informed of the recent death of Dr. J. S. Batchelor of Milwaukee. He was a life member of the society and I wish that the same committee would act with reference to proper memorial resolution.

G. V. BLACK MEMORIAL FUND.

As members of the dental profession, we have learned to revere and love the name of G. V. Black. Therefore, considering it a great privilege to be able to contribute toward the G. V. Black Memorial Fund, I suggest that one hundred dollars be voted from the treasury for such a purpose. Your executive committee was urged a year ago to make ample appropriation to this fund and so far no action has been taken on this matter. I believe a resolution carrying an appropriation of one hundred dollars ought to be presented at this session.

I will state in explanation of this that at a meeting of the Executive Council this morning it was voted to recommend an appropriation of $100 to the Black Memorial Fund.

FIFTIETH ANNIVERSARY.

Acting upon the recommendation of the committee reporting on Dr. O. G. Krause's address, I have appointed the Fiftieth Jubilee committee with the instructions to have a report at this meeting.

Members on committee are following:

Dr. A. J. Kuhnmuench, Milwaukee.
Dr. Adolph Gropper, Milwaukee.
Dr. G. E. Cleaphas, Beloit.
Dr. H. L. Banzhaf, Milwaukee.
Dr. G. W. C. Meyer, Oconomowoc.

DENTAL LEGISLATION.

We have a legislation committee appointed each year to carefully watch the interests of the members of this society with reference to State and National legislation regarding the practice of dentistry, and to co-operate with the National Dental Association Legislative committee whenever measures are proposed for progressive legislation. I believe there should be a License Reciprocity

Legislation enacted, whereby a dentist who by force of circumstances or choice may change his residence, and practice in any state of the union in which this reciprocity shall exist. For the qualification of such dentists I would demand that he be a duly qualified registered dentist as required by the law, and that he shall have belonged to his State Dental Society for ten years and all this period be in good standing and report. When this shall become a law you will find that many dentists that are now indifferent to dental society affiliations will make every effort to join. I would also suggest that our legislative committee work upon a bill setting forth the privileges of a dental nurse or office girl assistant and report at the next annual meeting of this society.

CLOSING.

In closing, I cannot refrain from expressing my appreciation and thanks to all who have so faithfully labored to make this meeting a success and my term of office as your president a most enjoyable task, and a great satisfaction. I believe that special mention should be made of the liberal self-sacrificing man of dental clinics, Dr. Adolph Gropper of Milwaukee. "He that knows by experience is wise and safe to follow." Another is your efficient, ever watchful, busy secretary, Dr. Theo. L. Gilbertson. He is truly deserving of all the honors and gratitude this society has at its disposal. Permit me to extend to Dr. Gilbertson the sympathy of all the members of the society in his recent sorrow and to tell him that we stand as true friends to make his burdens light.

The honor of being elected your president, I shall ever cherish as a token of highest esteem and a most valuable asset in my profession and life work. I thank you.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-THIRD ANNUAL MEETING, HELD AT QUINCY MAY 8-11, 1917.

DISCUSSION ON THE PAPER OF DR. GETHRO.

DR. JOHN P. BUCKLEY, Chicago:

Mr. President: It is hardly fair to ask a man to discuss a paper when he has not seen a copy of it. Dr. Gethro offered his paper to me at the dinner table tonight, but I was so busy with other things that I was unable to look at it at that time.

Last Fall, I think it was, Dr. Gethro was at Aurora and read a paper in the afternoon. I was there in the evening and read a paper; Dr. Gethro went home, and those who heard both papers stated that everything I said in the evening contradicted what Dr. Gethro said in the afternoon. On that basis, it might be expected that what I have to say on the subject will be contradictory of what he has said, and I have found that to be the case.

I must be awfully old-fashioned. I still use arsenic. First, let me say this: If any of you can go home and treat pulpless teeth successfully from what Dr. Gethro has said here tonight, you can do more than I can. I do not believe that I could go home and follow the technic that he has given. So I do not think it is fair for Dr. Gethro to condemn the use of arsenic with the statement that there are so many other well-known and good methods of disposing of the pulp tissue without mentioning what those methods are. If he means pressure anesthesia, I am here to say that the removal of the pulp tissue by pressure anesthesia in many instances, especially in cases of infected pulps, is a dangerous procedure. And I want to tell you, that there is more infection, and there are more lame teeth in the mouths of patients today as a result of the pulps having been removed by pressure anesthesia than there ever were by the use of arsenic in the same length of time. If Dr. Gethro means that we ought to use conductive or interosseous anesthesia for the purpose of removing these pulps, then I again say that the use of these methods in the hands of many dentists, where there is faulty technic so far as asepsis is concerned, is little short of criminal. I am old-fashioned enough to believe that the very best way, all things being considered, to remove pulps from teeth is to poison the pulp tissue by the use of that dangerous agent, arsenic trioxid. If you use it carefully to poison the pulp tissue, not devitalize it, and then depend upon some other agent to complete the devitalization you will have no trouble. I use formaldehyde gas for the purpose. If Dr. Gethro can use mechanics alone without the use of chemical agents in the cleansing and enlarging of these canals, I say he can use mechanics better than I can in the practice of dentistry.

I am sorry that Dr. Gethro did not take up the technic of filling these canals better than he did. Men today are using means and methods without giving those means and methods thought and consideration. I do not care whether it is Callahan of Cincinnati, or Rhein of New York, or Gethro of Chicago, if they tell me that it is necessary to use a certain means or a certain method or a certain drug or a certain chemical in the treatment of teeth and the filling of canals, I want the reason for using those methods and those materials, and there are hundreds of men to day who are using methods without knowing the reason why. This is wrong. We should study well and consider thoroughly every method offered and use only that which in our hands brings the best results.

(Here Dr. Buckley showed slides giving the results of methods of treating teeth and filling root canals by methods other than those advocated by Dr. Gethro.)

Dr. M. L. Hanaford, Rockford:

I do not know why I should be called on to talk on this paper after the splendid presentation of the subject which Dr. Gethro has given and the eloquent disquisition of my friend, Dr. Buckley. Nothing remains for me to say particularly except possibly to represent the common people, the people who Mr. Lincoln said the Lord must have loved, because he made so many of them. I suppose I represent the average dentist, to whom the method of operating which Dr. Gethro has described, and the manner of operating which Dr. Buckley has described, are, in my judgment, not practicable. We common fellows cannot have X-Rays made every few minutes of the teeth we are treating and filling. If we can have one picture made, or two, we are doing mighty well. They are misleading, as everybody says, but we have to have them and we do have them. It is folly to say that people will not pay for X-Ray pictures. They will pay for them when you point out the necessity of having them in certain cases and that they are going to be of benefit.

Absolutely aseptic procedures in the ordinary dental office I consider impossible, not that it is not desirable, but I think it is impossible and I might say unnecessary.

In going around the country and visiting the offices of different men of large reputation, I have seen them winding cotton around broaches and putting them into roots without previous sterilization. I make an attempt to sterilize cotton in using it on a broach; I do it in a way which I have never heard any one speak of. Perhaps it is hardly adequate; but I wind cotton on the broach, saturate it with alcohol and burn the alcohol, then blow out flame with chip blower as the cotton chars slightly. That is my method of sterilizing cotton. The gutta percha cones are placed in alcohol for a considerable length of time or while other preparations for the operation are being made. The pluggers also are laid in alcohol, then the canal is dried as thoroughly as possible with hot air, then moistened with chloroform or eucalyptol. The gutta percha is carried in on a fine broach, wound with cotton and pumped in as thoroughly as possible; then the cone is taken from the alcohol, dried on a perfectly clean napkin, seized with a pair of clean pliers, dipped into the eucalyptol, and then pumped into the canal very much as Dr. Buckley describes, only he uses chloroform. He said it is impossible to force the gutta percha cone as such through the end of the root if you use sufficient chloroform. I can see how he might force chloroform through, in considerable quantity, and chloroform I should say would be extremely irritating. I want to say this also; which is a thing I found out a good many years ago when I was passing around roots for you fellows to fill, afterwards filing them down and photographing them. Although you have enlarged your root by careful curettement until the broach will go completely to the end, it does not follow that your filling material will also go to the end. I have in my possession forty roots where the canals were large enough to drive a horse and buggy through, so to speak, yet the root fillings did not come within one-third of the end of the root. That same series of experiments showed that the smaller canals, on the average, were better filled than the large ones. The inference is obvious. The small canals were filled with chloro percha or some form of softened material which was pumped in, and the same technic in the large canals gave a porous material which often clogged and shrank enormously, leaving very large spaces and a honeycomb effect of the gutta percha mass.

Dr. Callahan's solution of rosin, it seems to me, in his hands makes a very beautiful operation. I have used that a good deal. It seems to me easy to use in lower roots, but extremely difficult to use in upper roots. I have never been able to my satisfaction to carry the solution of rosin into upper roots. Perhaps it can be done, but I have never been satisfied with the root fillings I have made in that way in upper teeth. Many times we can carry either chloro percha or euca percha on a nicely wound broach, and follow it with a gutta-percha cone, softened possibly a little in eucalyptol, and held over a lamp flame to further soften it and fill a root canal so satisfactorily that we can almost take our oath that it went to the end.

Now if we had a fibrous material of an indestructable character to use in this way instead of cotton that could safely be left in the root canal, would it not be a good thing? Who will find such a material?

Dr. Arthur D. Black, Chicago:

I think we should all be very careful about making absolutely positive statements regarding pulp conditions until we know a little more about the subject. I do not believe that any one knows today for sure whether arsenic is a safe thing to use or not. We have not the evidence that will justify us in making a positive statement either way. Until we know more about the other drugs which are being sealed in pulp chambers and root canals, it seems to me to be best not to use those which will destroy soft-tissue if they come in contact with it.

I have in the neighborhood of 10,000 radiographs of the teeth and adjacent bone, most of which were taken within the past two years. I am making studies of the root fillings as shown in these radiographs, and tabulating the abscesses in relation to them. In doing this, I am impressed with the fact that we must collect data on certain points before we can properly classify the causes of chronic alveolar abscess. I mentioned at the meeting of the Society last year in the discussion of this subject certain things which a number of us will have to do before we can really come to definite conclusions. For example, in these many radiographs I am making a tabulation of the teeth in which attempts have been made at root fillings. They are divided into two groups; those which have large canals, and those which have small canals. The following are classed as having large canals: The upper central incisor, the cuspid, the second bicuspid and the lingual roots of the molars; the lower cuspid, bicuspid and the distal roots of the molars. Those classed as having small canals are: The upper lateral, first bicuspid and the buccal roots of the upper molars; the lower incisors and mesial roots of lower molars. The root fillings for each group are tabulated as good or poor, and the per centage of abscesses in relation to good root fillings and in relation to poor root fillings will be determined. I would like to impress the fact that the showing of an abscess on one of these teeth which appears to have perfectly good root canal filling does not indicate anything at all of the relationship between the root canal filling and the abscess, because the tooth may have been abscessed before the root canal filling was placed. We would like to know how many of these teeth had vital pulps when treatment was undertaken. We would like to know if the pulps were destroyed with arsenic, or if they were anesthetised with cocain, and if in the treatment some medicament was employed which might have caused the destruction of the periapical tissue. This brings us up to this thought: before we can know these things, a good many of us will have to record the condition of each particular tooth when treatment is begun, and then keep a record in detail of what we do. If we keep a good record of these things, so that after a time we can check cases up with radiographs, we will know something of what we are accomplishing and what is causing so many abscesses. This problem has come to be too serious for us to accept opinions on these things We must have something more than opinions on which to base our future treatment of these cases, and until a considerable number of us are willing to go to the trouble of recording these things as we ought to record them, we will be unable to determine either the real causes or the best methods of treatment.

I want to say a word or two about asepsis. Asepsis is easily possible in the treatment of root canals, and it is practicable. It is practical and possible for every one of us. To be practical, it must in the very nature of things be planned so that we may carry out the technic without having our fingers sterile, without keeping our hands surgically clean. While it would be possible to have sterile hands, it is impractical under the conditions we have to meet. It is easy enough for us to use the rubber dam to sterilize the field of operation before we take out our temporary filling of whatever kind it may be. It is easy enough for us to have all broaches and burs and instruments which are placed into the tooth aseptic. This may be accomplished by immersing the instruments in antiseptic solutions. I use phenol in one dish and alcohol in another. We can sterilize burs in the same way, also the gutta-percha cone after it has been stuck on the end of the root canal plugger. The greatest difficulty is the sterilization of cotton pellets and more especially cotton wrapped on broaches. About three years ago Dr. Elmer Best, of Minneapolis, presented a plan for sterilizing cotton wrapped on broaches as well as the pellets. Dr. Best used moist heat sterilization which made it necessary to have special broaches, which would not rust. Since that time I have made use of a dry sterilizer by which the same thing can be done, and I thought it might be of interest to show one of these dry ovens which is controlled by an electric thermostat and kept at any desired temperature.

I have here one of these little ovens, which is heated by four small carbon filament lamps, and you can see that the lamps are turned on and off by the thermostat. This oven has room for six glass trays, each of which will hold six metal broach holders, with broaches, and the cotton may be wrapped on the broaches and placed in the oven. For each pulp treatment, one of the trays may be lifted out and placed on the operating table. The broach is picked up by the handle, without, of course, touching the broach or the cotton. I thought it might be of interest to show you this device in connection with this discussion.

Dr. Gethro (closing):

I did not go into the technic of root filling, because a paper of this kind would never be complete without hours of reading, and again, I have on previous occasions gone over that subject quite fully, so that I am on record as to my method of root canal filling.

Dr. Buckley asked about the placing of arsenic on infected pulps. I would not place cocain on an infected pulp, neither do I think he would place arsenic on an infected pulp. He asked what I would do if I used cocain in an infected canal. I would not use it, neither do I think he would use arsenic.

He spoke about using chloro percha and chloroform, with which I would absolutely disagree. I do not want chloroform at all in my filling of root canals. I do not think anything can make my root filling any more uncertain than the use of chloroform.

There are two distinct and different technics in the filling of root canals. On the one hand, we have small canals to deal with, and on the other hand, we have large canals. Dr. Hanaford says he finds that many of the large canals were very badly filled, and they were badly filled probably for this reason: the operator used the same method for filling a large canal that he used for a small one, namely, using chloro percha or chloroform, and using a gutta percha cone and this pumping motion, with pliers, as described by Dr. Buckley. That will produce about the poorest filling in a large canal that you can possibly have. If you are going to try to fill a small canal by using the method that I have described, you will get poor results. You had better use chloroform or chloro percha or some other method if you are going to try to fill these small canals with gutta percha points. It cannot be done, neither can you fill large canals by that method and get satisfactory fillings.

It is true, the smaller the canal, the less the shrinkage. The more chloroform you use the more shrinkage you will have. You will never get a satisfactory filling by chloroform that you get in the smaller canals with gutta percha. I do not use chloro-percha. I attempt to make the small canals at least large enough so that I can fill them with gutta percha points, and it can be done. Again, I do not use acids to enlarge these canals. If I can carry an acid or any other material into the canal, I do not care how small it is, if I can possibly carry it there I can enlarge that canal by this curettement process, and I can do it quicker than by the other method. If there is no place where the smallest smooth broach will go, what is the use of the acid? If there is no opening, it is a perfectly safe thing, it seems to me. If a root canal is large or small, if you simply enlarge it to a certain size so that you can fill it with gutta percha, it is the thing to do. I will give you briefly the method I would pursue. Under no circumstances would I ever carry a gutta percha point to a root canal with a pair of pliers, and under no circumstances would I ever take a piece of gutta percha of the size indicated. It would never be longer than three millimeters, which is a very small point. Previously, I would know the size of this root canal by carrying a root canal plugger to within two millimeters of the apex, and I would know that by my X-ray picture measurements. By previously having worked in that root canal with my broaches, I have definite measurements registered as to the length of that canal. I can then determine and select a root canal plugger that goes to within two millimeters of that end, and all these canals are tapering. Now then, when I select a root canal plugger that goes to within two millimeters of that end, I establish two things I know that I can carry a gutta percha point back to the very point where I took my measurements of the roots, what would be the size and thickness of the gutta percha point, and having established both of these things, I select a gutta percha point two or three millimeters long, and this being sterilized, eucalyptol is carried into the root canal in small quantity, so that it acts as a slight solvent for the gutta percha, and that small gutta percha point is carried right to the point where I measured on the root canal plugger, and I know it goes right to this point. There is another thing: if you will select a piece of gutta percha large enough, you can bring that to the point and you need not go beyond. If you select too large a point it will not go to place. That, briefly, is the technic I follow in the filling of root canals, and those who follow that method can treat these canals successfully. I know that they can. I would no more think of using some of the agents to render this field aseptic than I would expect a surgeon when he is going to open an abscess to treat it before he opens it. I would expect him to open the abscess and evacuate it at the earliest possible moment. That is the treatment I pursue in the removal of pulps that are infected.

Dr. Hanaford spoke of the drying of root canals. I do not think the drying of root canals is an essential. If a root canal is clean, I do not care to use hot air or any other means of making it dry. Eucalyptol carried on a broach with cotton will remove the moisture in that root canal. Eucalyptol has a greater affinity for tooth structure than most men think and the moisture will be displaced. You want a film of eucalyptol in these root canals. The more eucalyptol you leave in there, the poorer the filling is going to be. It is only a thin film.

DISCUSSION ON THE PAPER OF DR. KIRBY.

DR. W. F. WHALEN, Peoria:

Mr. President and Members of the Society: It is with a great deal of fear and trepidation that I get up before this Society to talk upon this subject. However, I feel it is a live subject and one that should interest everybody. I am not going to indulge in any preliminary remarks. I presume the reason I was placed on the program to discuss this paper of Dr. Kirby's was that I have been interested in the business side of dentistry for a great many years. For seventeen years I devoted what I consider to be the best years of my life to the practice of dentistry so far as energy and nerve force are concerned, and I did not make any more than a living. I realized about nine years ago that there was something wrong with Bill or his system. I started to take an account of stock and in a crude way figured out a plan which I put into use so far as my own practice is concerned. I started to find out why it was that I was spending as much as ten hours a day on an average in my office, and still I was not laying by one penny for the inevitable rainy day which comes to everybody and after analyzing it I adopted a plan by studying the cost of my education, the amount of money that I had put into it. This was a rather crude way of getting at it, but it was the only way I knew to get a start as to overhead. Then I figured up what my bills were annually for supplies, gas, electricity, and other things. I heard a business man who was a patient of mine say it was the custom of business men to charge off ten per cent. annually for depreciation, so I thought that was pretty good. I charged off ten per cent. for depreciation, but I did not set ten per cent. aside as a sinking fund until about a year ago, when I woke up and started doing that. Ten per cent. was charged off to lay by. Then I got to the point of salary. I had figured out pretty nearly everything, all my expenses of running the office, and then the question came up how much salary should I charge off. From those I had known in other walks of life and those I knew were working upon salaries, I determined what I thought was a reasonable salary. That is the way, therefore, that I arrived at what I should charge for my services. Understand, this was before the days of brother Bill or anybody else, when the wise fellows in the profession, those who had lots of nerve, deprecated any remark with reference to the business side of dentistry, as tending towards commercialism. These men were really getting big money because they were shrewd and could do it and put it over. Those men objected to open discussion of such things, but the rank and file of the profession, myself included, did not have the ability to get by as they did. We needed somebody to instruct us, to give us a tip, as it were, and that is what Dr. Kirby has tried to do for us today, to get us thinking right.

Dr. Kirby is a practical man; he does not mince matters, and therefore, some of the things he has said, perhaps will not take well with the ultra-conservative, ethical man. I have not known Dr. Kirby long, but in the short time of our acquaintance I am satisfied that he yields to no one when it comes to his loyalty to the ethics of the dental profession, as I myself yield to no one.

We are here, gentlemen, as friends to bring before our organization something concrete, so that we may be helpful to one another. We have listened to some of the best papers since we have convened in this session that it has ever been my pleasure to have listened to. The discussions have been equally as good. I think it is a splendid thing that we have mixed in with all of these scientific papers and discussions something that we must acknowledge we are vitally interested in. We leave our homes and come to these sessions, close our offices, what for? We come here to get up-to-date knowledge in the practice of our profession. Do we do it for our own benefit solely? No. We do it for the love of mankind, and that we may serve our patients to the best of our ability to give them the latest thing there is. It costs us money to do that and are we going back home after having spent our time and money, preparing ourselves to render a higher grade of service to the people, and absolutely forget or ignore the fact that these services are worth more? Our attendance upon every session of this Society or any other society, it makes no difference how small, enables us to render a service that is worth more to our people. What are we going to do about getting that extra remuneration? Does this savor of commercialism and all that? I do not know anybody who is practicing dentistry for glory or love alone. I do not know of dentists who wave their hands at their patients and tell them there is no fee. They are all in the business for service first, but there must be remuneration, and let us all get together on the proposition and solve it in a manner in which it should be solved. We must regulate the cost to the patient, not empirically. We must be honest in regard to our fees, and the man who does not know what his overhead expenses are, who does not know what it costs him to maintain his home, and who does not have a definite sum figured out from which he feels he could lay aside for his old days or for the nonproductive days of his life, or for his family in case he is summarily removed from this field of usefulness, he is not making his fees honestly. I won't say he is dishonest; he is doing it empirically. In other words, he does not know why he is doing it. There is only one way to arrive at a proper standard of fees, and that is to have a knowledge of what we have invested in our profession, in our equipment, what our overhead expense is, and what salary we feel we should get. I have been keeping track for several years of the number of actual hours that were productive, hours that were bringing me in something. I have found from the records of several years that I was putting into my office approximately 2,500 or 2,600 hours. I also found that productive hours for which I received pay directly were only about 1,100 hours. After getting all my overhead expenses, rent, salary of my assistant, and other things, and having placed in an amount that I thought was right for salary, I divided the total by 1,100 and this was what I based my fees upon. I kept records of the time it took me to make a crown, to treat a tooth, etc., and I tried in a crude sort of way to balance my fees so that each operation would take care of itself.

Dr. Kirby made one point in regard to having everything take care of itself and to throw sentiment aside. I do not quite agree with him in that. Perhaps I misinterpreted him, and that he feels as I do and the rest of us do. But I do not believe that any man should remain in the practice of dentistry and throw aside sentiment. We are serving people in the capacity of rendering relief from suffering. People present themselves to us for treatment the same as they do to the physician, and we should have sentiment uppermost in our minds in our handling of everybody.

There is one phase of this subject I want to call attention to, and that is, we should be in a position where we can render all possible assistance to the poor of our communities. Unless we have some system of doing business and know where we stand, we cannot render that service. Many times, I believe, and in our local community I know it to be true, there are dentists who are serving on our hygiene staff and working for people who ought to be helping them rather than they rendering gratuitous service to the people. How are you going to solve the problem? You are not going to enrich the poor; you will not place them in a position to care for themselves, but you can put yourselves in a position where you can render that service to these poor people and be a party in the uplift.

In view of the trying times we are going through in the world war conditions, I do not have to call your attention to the fact that the cost of living, the cost of running a dental office today is approximately fifty per cent. more than it was at the outbreak of the war. How many dentists in this room have increased their fees fifty per cent. since the war broke out? If they have, what ground did they have for increasing them? Have they kept a cost account? Do they know where this excess cost is coming from and how it should be cared for? I question whether many dentists know very much about it. These conditions exist and we must meet them. We must have a readjustment of our business every so often and find out what the cost is. I am going to make a readjustment right now, and after I get back home the fees of the office are going to be raised. They must be raised because everything is out of balance. I know it has been out of balance for several months, but I have not got down to a readjustment. The fees will go up to cover the increased expenses of running the office and the increased cost of living. The salary must be raised.

There is another thing I want to speak of which should interest all of us. There are dentists going around to meetings and other places and telling how much money they are making. One fellow says that last year he made $6,000 or $8,000. Don't forget for a minute that Uncle Sam is going to keep track of us as well as keeping track of everybody else, and I serve a note of warning right now that it is not going to be long before somebody will come into your office and ask you how much business you did last year, and you throw out your chest, swell up like a pigeon, and tell him how many thousand dollars of business you did and what your expenses were. Well, you say, I tell you, I am a Napoleon of finance, I run my office for $1,500. Then Uncle Sam's representative will say you made $8,000 cash last year, and your expenses being $1,500, we will assess you on the balance. When he tells you that you will wake up. There will be war taxes in addition, to pay and they will be more than they are now. So it behooves the members of the dental profession to be on their guard and tell the truth about their incomes. You are not going to fool Uncle Sam.

I made some exhaustive investigations and arrived at the conclusion that approximately eleven or twelve per cent. of the men practicing dentistry in the United States are considered good risks. I made that statement in a paper read before the Illinois State Dental Society at its meeting in Peoria, and it will be borne out by statistics that about eighty-eight per cent. of the men practicing dentistry at that time were not considered good risks. I do not believe conditions have improved very much up to the present time. Those dentists would perhaps have been better off had they been working on a salary. They are assuming responsibility; they are performing operations for which at any time they are liable to suits for malpractice. They are doing many things that the man who is employed does not have to do. They have to live in a more expensive way, and these are the deductions drawn from my investigations. It should not be that way. We pose as a body of intelligent, professional men. It is the business of each individual member to go home, if he has not at the present time a system, and establish one of some kind and work it out, and if this is done, you will find that he will have more left at the end of the year, and it will be good, honest money, and his conscience will be easy.

Dr. Robert W. Hood, Monmouth:

Within the past few years there has been a book written the title of which is "When a Man Comes to Himself." It is written by a very prominent statesman.

As has been stated by Brother Bill, the time he comes to himself may not be until his death, or it may come a few years sooner.

Some twelve years ago—I think it was in 1905—in the city of Quincy was held our first district dental society meeting. At that time I had the pleasure and privilege of presenting a paper on the business side of dentistry. I saw that business and ethics in the profession could not be separated; that they must go hand in hand; that if we practiced our profession ethically, we must conduct our business scientifically if we would succeed, if we would do ourselves justice, and if we would do our patients justice.

I am not going to stand here and tell you what your salary shall be. If this was a body of school teachers and you were applicants for a position in the schools, you no doubt would say that your respective salaries should be governed in accordance with what you were expected to do. In other words, you would place a valuation on your services. You, as professional men, have the same rights to place a valuation on your services; so, therefore, the expense of conducting your business may be greater than the expense of conducting mine, and yours must be figured from a slightly different basis from what I would figure mine. The overhead or cost expense of performing every operation must be carefully considered. I disagree with Dr. Kirby, and I have cause for disagreeing with him, in one respect. Dr. Kirby spoke about estimates. I do not think it is possible to be fair to your patients and make an estimate of any extensive operation any more than it is possible for an attorney to give an estimate of what it will cost to carry a case through one or two or three courts; nor do I think it is possible for a physician to estimate what it will cost to bring a patient back to recovery. So I do not think it is possible to estimate these things. The services of one person are not equal to those of another.

The question of criticizing ourselves has been brought up. Now, I do not mean to say that I treat everybody alike. There are our charity cases, our poor people, that we can take care of in our nonproducing hours, and it does not conflict with our business arrangements, or should not. I am a great believer in system. Everything is done by a system in my office. I am telling you my experience, and I will probably hear from others as to their experience. I have a system for every operation.

The statement was made by the essayist in regard to making two crowns at the time that one should be made. There is a point that I shall have to differ with. I do not think it is possible to make a fee for a crown of any description. I do not think it is possible to make a fee satisfactory to yourselves for a plate; I do not think it is possible to make a fee that is satisfactory before hand for a root canal filling other than on the time basis; therefore, my business is all conducted on a time basis charge.

I wonder how many of us have ever taken an inventory of our offices. Something like four or five years ago when I took the first inventory I ever did in my life, I was surprised to find how much money I had invested. I was surprised the year following to find how much my depreciation had been on the stock I had put in. I was surprised how much it cost me to do business. I question very much whether the majority of this body know what a given operation costs them. I question very much whether a dentist in country practice, if he has a practice of say $6,000 a year has any idea or knows that to earn this $6,000 it costs him upwards of $3,000 to do so. That may seem strange to you. The only way to find these things out and to be accurate and fair with yourselves is to keep careful records.

There was one thing that was brought out which I think we should be very careful about, especially if we are going to change our methods of doing business when we get home, and that is a classification of our operations. After a year's time probably you can make a little more accurate estimate of the time that has been consumed in regard to these operations than we can do now. For instance, in the case of treating a putrescent pulp, one gentleman said yesterday that he treated a putrescent pulp case with two treatments. His fee should not be as large as the one who took four or five times that long to render that same service. So I think it is a very good idea to classify all operations so that at the end of a month you have so many root canal operations, so many crowns, so many inlays, so many silicious cement restorations or fillings, and so many of this and that, and find out whether they have all worked out satisfactorily to yourselves.

I have not very much more to add to what I have already said. If you inaugurate this system, it will not be necessary for you to tell your patients what your fees are. Your office assistant can make your fees if she knows the salary you expect to draw. That may be strange to you, but I will say this: I presume that nine-tenths of my fees are made by my lady assistant in the office. She knows absolutely how many hours or minutes I have given to that or this patient. She knows how much my overhead expense is for every hour; she knows what my salary for that given time should be; therefore, my assistant makes my fees.

Dr. Edmund Noyes, Chicago:

There are one or two things I want to say on this subject, and please do not get it into your heads that I am controversial or antagonistic about it, for I am not.

The first thing I want to say is that sentiment and business should never be divorced in any calling. No man has a right to pursue any calling in life except under the dominion of sentiment of service. Dr. Kirby did not mean anything offensive or objectionable when he said that sentiment should be left out of business calculations. He was not taking a broad a view of the word sentiment as I take and as I want to take. Having said that, the scope and the necessity for the sentiment of service, and the sentiment of good will, is very much greater in some employments than in others, and there are few in which it is greater than in the practice of dentistry and the practice of medicine. It takes a much larger place than it does in ordinary life and business transactions. It must have a larger place if we are to do our duty.

It has been a great pleasure to me to listen to a discussion of the business aspect of dentistry and not hear any slur or inuendo or objection in any way to our professional code of ethics, or our professional standards of ethics. That has not been the case always in discussions of the business side of dentistry in the past ten years, and I am very glad to see that aspect of this discussion this afternoon.

There is one other thing I want to make strenuous objection to, and that is, basing your fees upon an hourly wage. We are not plumbers; we are not carpenters, and not journeymen painters, that we are to work by the hour. I will grant that the time spent in our services is the most important element in estimating our fees. I will not quarrel with you a great deal if you say that time is the most important element. I will not quarrel with you if you say it is as important as all the other elements, but there are other things that must not be ignored in estimating fees. There is the question of skill in a particular operation as distinguished from the skill of some other operation, perhaps of a similar kind. There is the question of experience. There is the question of soundness of judgment. There is the question of acquired reputation and standing in your profession and with your patients. All these things as well as the time have an important relation to the fees that you should get. The fees you should get should have an important relation to the ability of your people to pay.

When I was a very young man and just beginning to practice dentistry, I did not think I had a right to charge one person more than another. I got over that in a little while, and I tell you, it is a prerogative, a privilege, a duty, of a professional man as distinguished from a business man to make some of his patients help him take care of some of the other people. It is a professional duty because we are practicing a profession instead of conducting a business. A merchant ought to do something for charity in the sale of his goods, but he must practically take it out of his own pocket. We have a right to make our standard of fees such as will leave us with a recognized margin for charity work, and that is the most important element that was omitted in Dr. Kirby's paper and in Dr. Whalen's enumeration of overhead expense. In addition to your equipment, your depreciation, your salary, and your dental depot bill, add something for charity, for professional charity is a part of your duty and service in the community in which you live. This is more important in our profession than in any other profession that I know. In the medical profession there are hospitals, there are free infirmaries, where the poor people can go for medical service. We have nothing of the kind, and if our individual men throughout the country do not do the charity work for the dental profession it will not be done. We must take care of it individually at present. I hope the time will come when we shall have dental hospitals and dental infirmaries. You may say something about the dental schools, but if they did charity work exclusively it would be a drop in the bucket. As a matter of fact, the students in dental schools are rightly encouraged to bring their friends and acquaintances to the clinics for their own operations as the beginning of training and experience by which they hope to win a practice after they get out, and it is a proper permission that they should have, and of those people who come in that way very few questions are asked as to whether they are able to pay or not.

I think, gentlemen, you have had some excellent advice this afternoon, and I wish that a greater number would profit by it. It will necessarily result in a considerably wide range of standards in the fees that different men will find it necessary to charge or think they ought to have. I do not think that it would result in any wider range of fees than there are at present and it would rest upon a better basis. This is to be said also, that we are not quite absolutely independent each one by ourselves in regard to the fees that we can ask for and get. There is the influence of competition and custom in other members of the profession, and in the expectations and experiences of the people whom we serve, and to carry out the advice we have received this afternoon will require some salesmanship, some talk, some explanation to our patients. Almost all of you can get away with it I believe, and if fifty men, for instance, would make such estimates and keep such accounts for two years, as Dr. Whalen and Dr. Kirby have advised and suggested, and then furnish the results of that unanimously, if you wish, so they could be averaged and tabulated, I believe we could raise the fees of the entire dental profession.

Dr. D. D. Campbell, Kansas City, Mo.:

I think that it is very essential for the members of the dental profession to find out what it costs them to practice dentistry. Our good friend, John Kirby, I know very well because I was a student in school with him. He was graduated from one of our Kansas City schools. He is brusque and hits straight from the shoulder and tells you exactly what he thinks.

I can say this for John Kirby, that he has this matter at heart and when he said, let us throw away sentiment, he meant to throw away sentiment for the time being, not when the patient was in the chair with the toothache. He is as glad and as ready to do something for his fellow-men as any man I know. He got sentiment in the wrong place. Before his paper is published I shall take my blue pencil and cut out one or two lines that I do not like and I think in his good judgment he will allow me to do it.

Dr. Noyes stole some of my thunder. He said something about ability. A successful dentist must possess three or four characteristics which are fundamental in business. The first of these is ability. Now whether we practice salesmanship and call it such, we all have the tendency to educate our patients, whether we call that salesmanship or not. We must be able to deliver the goods whether we have any system or not, and the best foundation upon which to build a system is ability—and a full appointment book. Dr. Kirby recognized that ability is fundamental. Back of ability is reliability. And then following the key-word in studying salesmanship, the next requirement is endurance. When a man goes to his office and practices dentistry from eight o'clock in the morning until six o'clock at night, without recreation, and then rides home, that man will be through with dentistry a number of years short of his allotted time. We must have endurance, and to get endurance in dentistry or in any other profession we must go outside of the groove to get it. We need to get some hobby, that is, play golf, or bowl, or fish, or chase butterflies, or adopt some other diversion.

Dr. Noyes said something about plumbers. I respect and even admire the ability of skilled plumbers. Whatever a man may do, if he does well what the many men do in a mediocre way, he is deserving of praise. Some of us need not be ashamed in the presence even of skilled plumbers. We are plumbers; we are mechanics; we are scientists; we are chemists; we are students of medicine, of art, of aesthetics, and all of these things and many others go to make a dentist. Dentistry is a science that draws many aids from many sciences.

Finally, there must be activity, and by this I mean dental activity. It means going out and attending dental meetings. I was not a little chagrinned in Illinois at the dearth of young men in your State Dental Society. That was astonishing to me. I believe that in Missouri and in Kansas we have a great many more young men members than you have. We have numbers of young men, ignoramuses like myself, in the dental profession who are seeking knowledge, and there ought to be more young men in your society, since, to my way of thinking, Illinois, and Chicago in particular, is the center of the dental universe.

Dr. George D. Sitherwood, Bloomington:

For many years I have been attending the state dental society and hearing papers of this kind. There is no class of papers we need more than such an essay as we have heard, or speeches along this line. Every year I go home and I raise my fees a little, but I never get them as high as they ought to be, because the average dentist does not receive the fee that he ought to receive for the kind of service that he renders.

I regret that so many of our young men do not attend these dental meetings more. They make the excuse that they cannot leave their offices; that they cannot afford to come. That is where they make a mistake. I am glad to have heard this paper and the discussion on it by Dr. Whalen. In my practice I sometimes give an estimate, and to many of my regular patients I do not need to do this. It is not good to have a hard and fast rule, that is, an inflexible rule. I recently spent half an hour in trying to convince a gentleman that I should receive $50 for a certain operation while he thought I should receive only $25. He will pay me the $50 instead of $25, as I was able to persuade him that I ought to have a fee of $50. I could not do that operation and not let him know before hand how much he should pay. So I do not think in my practice it is a good thing to charge by the hour because sometimes I like to earn $10 an hour and sometimes I do not earn 50c. I am doing service for my patients, and after I have worked an entire day to make good that service, I feel that I have accomplished something. We are both mechanics and professional men. A great deal of our work is mechanical, but we must remember we are likewise professional men. Undoubtedly, many of you will remember that in the olden days physicians did not charge a fee, but left it to their patients and the people, especially the nobility, to pay them whatever they thought was right, and some of them received large fees. But in this commercial age we must do differently. I am glad to hear the essayist encourage us to save more money, to make more money, and to charge a fee that is worthy of the service that we are able to give.

Dr. C. N. Johnson, Chicago:

I would not like to go out of this hall without giving expression to a sentiment which I know must be in the hearts of a great many of those present. I believe in systematizing all our efforts; I believe in conducting practice along those lines whereby a man knows what his expenses are, what his income is, and have something for himself at the end of the year. I am amazed at the statement that any man in our profession will conduct his practice today without knowing his overhead expense. But, Mr. President, the thing I am afraid of is that in discussing these subjects in this broad way, we are going to develop in the minds of the profession a wrong point of view, which is not a professional point of view, and when the time comes that we permit commercialism in the profession to dominate, and relegate professional service to the rear, it is the most dangerous period in the history of our profession. (Applause.) There has been altogether too much of that in recent years. Our profession is rapidly gaining the reputation for holding people up for the most they can get. That is not right. I do not mean to say that we shall not get good fees. I believe as practitioners of dentistry we should demand good fees, but as some one has said, before we can demand and get good fees, we have to deliver the service. Another thing I will say, if you deliver that service in a skillful manner, the American people will not begrudge you your fee. The great trouble is with many men in the profession they have not systematized their methods of conducting practice. We have the reputation as a profession of being poor business men; I know that may be considered a reflection, but Mr. President, I would rather have the reputation of being a poor business man and a good professional man than to have the reputation of being a good business man and not a professional man. There is a distinct difference between the conduct of a professional practice and the conduct of an ordinary business. If there was not that difference, we would not have a professional status today. If we had paid more attention to the professional aspects of our activity, we would have a higher professional status today than we have. I deplore the tendency in any profession of any man trying to conduct his practice without system and without a careful deliberation over his income and outgo. It is not justice to his family to do that. There is a great wave of business talk and of salesmanship passing over the country. I do not like the term salesmanship as applied to professional life. I believe what has brought this about has been the fact that in the past we have been presented with the spectacle of knowing and seeing men in dentistry reaching an old age without the competence which they should have to keep themselves and their families. But in this, as in every other thing that comes into the profession, we have had a swinging of the pendulum too far, and there are too many articles appearing in our periodical literature talking about business methods.

Inasmuch as the question of charging one patient more than another has been brought up, I will give you a concrete example that happened in my office last week. A gentleman was sitting in my chair; I excused myself for a moment to examine a skiagraph that had been made for another patient. This lady came into the office under great trepidation. She was told that she had to have the end of a root cut off because the tooth had not been cured in two weeks' treatment. I sent her to have a skiagraph taken. She brought that to me and I said she would not have to have the root amputated. This gentleman remarked to me as I came back to him after having left the lady, and he having overheard a remark to the effect that she was not able to pay for dental service: "Dr. Johnson, it will give me great pleasure to have you make my bill sufficiently large to help pay for her services." That is the kind of sentiment we want to create, not that we shall make a practice of charging one patient a large fee to favor another patient, but if we create a reputation for honesty in dealing with people, we will find many people in this country who will be very glad to pay a compensation which will enable us to take care of other people free of charge.

Dr. John P. Buckley, Chicago:

It is not my desire to discuss this subject at length. There is no reason why we cannot be good business men and professional men at the same time. There is no man who is looked upon as being a truer professional man than the lawyer or physician, and yet lawyers and physicians do something that nine-tenths of you men do not do in your own practices, and that is to make a charge—I don't care how small or how large—every time a patient comes into your office.

Don't get into the habit of letting patients come in unnecessarily every week day whenever there is anything the matter with them. Take one hour of the day or half an hour if that is sufficient, and then let your patients know that they can come without an appointment between 3 and 4 or 4 and 5 o'clock, and I hope it is not later than 5, so that you will find that your balance sheet at the end of the month will show a different footing. You know just as well as I do that you have patients in your practice that bother you to death; they come in and impose on you. They want to see you in the next 15 minutes to get a toothache stopped when, as a matter of fact, that tooth is not aching worse today than it was three or four days previously, and the patient has been going on attending to social affairs, and so on. My patients know, if they know anything, that the only time they can see me without appointment is between half-past 3 and half-past 4 in the afternoon. You can come to my office every day at noon, if you want to come in, and you will not see a patient there at that time when I am at lunch. My patients know they cannot see me then unless previously arranged on the phone. They cannot see me personally in reference to an appointment hour unless they call on the phone and inform me they are coming in and nearly every one that comes in is charged a fee. I do just as much charity work as any of the rest of you. My patients know it. I believe in giving a flexible estimate, then you will not have much money on your books at the end of the year. I have not worked in my office for three months, from the first of February until last week. My bills were all collected before I was taken sick. It is one thing to charge a fee and another thing to collect it. I want to say, you can be a good business man and a true professional man without the one interfering with the other.

Dr. Mary B. Meade, Carmi:

As to sentiment and business, they cannot be divorced. We cannot do without either, but we should all get together and get this business education. We should know how to charge for our services. We cannot all afford to be salesmen when we should be rendering valuable service, and we cannot do our work for nothing. In practice, if I do not know how much Mr. Brown or Mr. Jones or Mrs. Jones can afford to pay for work, it does not take but a moment to find out how much they are worth, and they should have what they need in the way of service regardless of whether they are able to pay for it or not. Service is the thing, and if we cannot get what we ought to have for that service, we should render it just the same. And then we should possess business sense enough to know the amount of money we collect, our expenses, and so forth. We must do it because we shall all have charity patients until the state and nation take hold of the matter and pay for these patients as they should. Salesmanship is all right in its place, but most of the time it is out of place while talking service, but service and good sense go together, and good sense includes business. The average dentist should know what his expenses are. Some of them do not. We at our house keep an account of our home expenses and our office expenses, and at the end of the year we know where the bulk of the money goes, what we have received, what we have at the end of the year over what we have spent, and if it is not enough, then we raise our prices, and we are raising them all the time. I believe in doing good work, and we cannot do good service unless we have ability, and we cannot have ability unless we can have the time to apply ourselves to our profession. We must get money to pay our grocery bills, but money must be a secondary thought, and yet it must come to us by instinct. There are exceptions, of course, where patients are not able to pay you what your services are worth. If you go to Kelly and Burnam, of Baltimore, the great radium experts, or to the Mayos, they do not say anything to you about what you will have to pay. They find out your circumstances, and if you are not able to pay very much, they set a price, and then let Mr. Hill or some other rich man pay $5,000 for an operation to make up for those who underpaid them for their services. Every one should be impressed with the importance of paying something for service rendered if they can possibly do so, but if they cannot, those who are well-to-do and are able to pay good fees should pay them so that the accounts will balance.

Dr. James D. McMillan, Macomb:

The greatest and highest word for humanity we can acknowledge is duty, and if that word were kept in mind it would clear up the whole situation. We represent the professional side of the state, and why can't we do as the Canadian Government has done, put out a bulletin on dentistry which ends with the wonderful statement, strange as it may appear, "The oftener you visit your dentist, the less it will cost you."

The value of our services does not lie in the fillings we put in, in the bridges and crowns we put on, but in saving or preserving the teeth which Almighty God has put into the heads of people in the first place. The value of our work is in the service we render in retaining these original organs. A lot of this war we have is simply from ignoring fundamental principles of justice. If we do what is just, then we will have peace between ourselves and patients. If we do justice as a profession we will have peace. It is much better to have schools to teach us how to avoid error than it is to have hospitals to cure us after we have made mistakes. I believe with Dr. Raper, of Indianapolis, it is a mechanical problem. When you have 80,000,000 of people to deal with, you have got to do a lot of charity work if you do root canal filling. I believe in prevention. I believe abstinence is better than prohibition. When you consider statistics, I believe we have too much money to spend in this country per capita for tobacco and altogether too much for alcoholics which have their effect both on the teeth and physical condition of the body. I have had people say to me, why do you say all these things and do not educate the public regarding these evils. If we undertake the responsibility of putting these facts before the public in the manner that they should be, we could point out to them that many root fillings would not be necessary. We should impress upon the people the importance of coming to us in the stage of prevention. That is what we ought to bear down upon. If people can be instructed to visit the dentist and have their teeth attended to early, it would cost them much less in the end.

Dr. Kirby (closing):

I want to thank Dr. Buckley for his remarks. He came nearer giving a constructive criticism than any one else. Furthermore, I want to thank Dr. Campbell for what he said.

I have come in contact with thousands of dentists all over the country. I have had them come to me and tell their story. I am at present located in Chicago, and within the last 30 days men have come from across the continent to spend a month or six weeks in Chicago in order to do special work, and when they got there they told me their story. I said to one of them, "Doctor, just tell me this one thing, what are the gross receipts of your office?" His reply was, "A little less than $3,100." I said, "How can you support your wife and two children and yourself and come to Chicago on such a proposition as that? You are coming here to make yourself more competent to treat your patients, and you are not doing one thing to get better fees with which to support your family like you should support them." I can name hundreds of dentists in the state of Illinois, and I have talked to hundreds of them, and I know what I am talking about when I say that the dental profession is the poorest paid profession in the country. They are not here probably this afternoon. You fellows do not need this kind of talk, but they are in Illinois, and they are in Kansas, and they are in Nebraska.

We hear an awful lot of sentiment about the poor working girl and about the poor widow, but nobody has said anything about the poor wife at home. I have talked to the wives of dentists on many occasions. Those women will get right down and tell you what little money they receive from their husbands with which to run their homes, and when you talk about sentiment, let us have a little more of it for the people at home.

REPORT OF CLINICS, 1917.

CLINIC NO. 1.

A—Dr. Rupert E. Hall, Philadelphia, Pa.:

Impressions—A method of taking impressions with cast plaster, without distorting or disturbing the normal position of the tissues. Cast plaster, hot water and potassium sulphate are combined and stirred constantly until setting begins; it is then immediately placed in an especially prepared tray of S. S. White's Impression Tray Compound and inserted into the mouth.

The first impression will indicate where improvised tray impinges on muscles or other tissue. This portion of the tray is trimmed away and another thin mix of plaster placed in the tray and the impression taken again. This trimming process needs to be repeated and from two to four mixes are usually required.

B—Dr. Maurice B. Mann, Kansas City, Mo.:

"Manipulation of Spence Plaster Compound."

The Hall impression is imbedded in plaster to give a hard base or support to receive the Spence Plaster Compound. The outline of the impression is marked and Plasticene (Kindergarten Clay) built around the impression as a matrix. The Spence Plaster Compound is mixed very thick—approximately one part water to four parts compound. Wet the plaster impression, which has previously been coated with shellac and sandarac, and introduce into this the Spence Plaster Compound, jarring constantly. After the matrix is full the tray containing the whole is jarred from eight to ten minutes. This smoothes the surface that is later to receive the rubber.

C—Dr. Ben F. Blanton, Paris, Mo.:

"A Better Method of Taking the Bite."

Bite plates are constructed of reinforced Graft's Base Plate Material and hard pink base plate wax. No attempt is made to obtain the occlusal plane—the upper and lower are merely trimmed to meet the requirements of the lip lines.

The lower is heated with a "sizzling" hot spatula until the surface is a veritable pool of wax. This requires from eight to ten minutes, at least. When the wax has congealed, the lower is placed in the mouth first, then the upper; the patient is requested to place the tip of the tongue to the posterior border of the upper bite plate and to close; the wax on the upper imbeds itself in the lower and when cold they may be removed without fear of distorting. This method obviates the necessity of using staples or pins to fasten the two bite plates together in their relative positions. They may be removed one at a time if desired and then placed together out of the mouth, with the assurance that no change has taken place.

D—Dr. Dayton D. Campbell, Kansas City, Mo.:

"The Hall Articulator."

The Hall Articular is designed to reproduce the normal movements of the mandible. It is based upon the fact that the tactile sense of the tooth cusp is the guiding factor in determining movements of the mandible.

Distinctive features of this Articulator are that it provides:

First—A deep over-bite.

Second—Space for the bolus of food.

Third—Balance of dentures in incisive movements.

E—Dr. Thomas White, Naperville, Ill.:

"Automatic Grinding of the Occlusion."

After the dentures are polished and finished, the occlusal surfaces of the teeth of the lower are covered with a sheet of pink wax and the excess over-lying the antagonizing surfaces cut away. When the wax has been slightly warmed on the lower, both dentures are inserted and patient requested to close. The wax prevents the inclined planes of teeth which may be in abnormal relationship from shifting the mandible to a bite which would be incorrect. This corrected bite, in place on the articulator, is ground into normal cusp relationship. In the grinding process a mixture composed of No. 90 carborundum powder and glycerine is used.

F—Dr. W. Clyde McClelland, Kansas City, Mo.:

"Cast Gold Bases."

The impression is poured with Spence Plaster Compound. From this cast a duplicate cast is made of Alston's fine inlay investment material, or of any other fine, strong suitable material. A wax pattern of the base is constructed upon the cast, using 30 gauge wax—the writer prefers "Castgold" wax on account of its toughness. The palatal portion of the wax is extended to form the sprue. The pattern and cast are now invested in a cow-bell flask, the investment material mentioned above being used for this purpose, and a truncated cone-like "crucible-former" is placed over the sprue.

When the investment has sufficiently hardened, the crucible is cut to proper form and the "crucible-former" removed. The flask is placed near a flame and dried out as quickly as possible and heated hot. Refined gold is placed in the crucible and melted to white heat when the molten mass is forced into the mold by air from an automobile horn bulb, connection between crucible and bulb having been made air-tight with properly placed "Moldine" compound.

No. 2—C. F. B. Stowell's clinic consisted of the demonstration of the removal of an impacted upper third molar at the office of Dr. Wolf, of Quincy. Regional and infiltration anesthesia by novocain was used. The bone was removed from over the occlusal surface and from the axial surfaces of the crown and a large part of the root by chiseling. An office was selected in preference to the armory as your clinician has always believed in a proper environment for such a serious operation. Dr. Stowell wishes to thank Dr. J. H. Hospers for his assistance in the operation. Clinician also desires to compliment Dr. Wolf on having an office so well equipped, and to thank him for tendering its facilities for the clinic.

No. 3—F. L. Miller. Removing a Lower Third Molar Under Conductive Anesthesia. The mandibular injection was used to demonstrate conductive anesthesia. The remaining roots of a broken lower third molar were removed.

No. 4—Val H. Frederics. No report.

No. 5—E. G. Nertney. No report.

No. 6—C. E. Read. No report.

No. 7—L. L. Funk. No report.

No. 8—F. A. Poynter. No report.

No. 9—W. E. Snow. Root Canal Technique. Clinic consisted of extracted teeth showing the different steps of root canal preparation and instrumentation; diagnostic wires in root canal, ionization, and root filling by the Callahan Method using rosin and chloroform, bismuth oxid hydrated and gutta percha. Also demonstrated the removal of old root fillings with Zylol.

No. 11—F. H. Bowers. Putrescent Pulps and Treatment. Hold tooth between thumb and finger of left hand to prevent vibration, use a small bur to drill into pulp chamber. Open into pulp chamber and then graduate bur until opening is large enough. Wash canal with warm water, then clean with alcohol until all putrescent matter is removed. Seal in paraform cream being careful not to use too freely, a little goes a great way. I will guarantee you will not be worried by an alveolar abscess. Paraform Cream—Paraform, Thymol aa zi; mix in mortar immersed in warm water. Add Zinc Oxid ʒii. Beechwood Creosote enough to make a paste.

No. 13—E. C. Pendleton. Gold Inlay. A number of cast gold inlays showing restoration of atrophied first molars also models showing cavity preparation. Inlays both in models and in mouth of patient had been tempered by use of automatic engine mallet before inlays were set. Inlays cast of pure gold (24K.) and tempered to withstand stress of mastication.

No. 14—D. N. Lewis. No clinic. Did not attend on account of illness.

No. 15—F. H. Swartz. No report.

No. 16—C. W. Hillier. An Inlay Bridge that will stand up. The essential part of an inlay bridge is the preparation of the cavity. Take a case of pyorrhea where there are one or two lower centrals missing, which we very frequently see. The method employed is to cut a slot, so to speak, in the two adjacent teeth from the labial to the lingual side about the thickness of a penny, using a thin carborundum disc. Then with the same stone cut a shoulder on lingual of tooth. In molars and bicuspids you may cut the cavity mesio-distally as well as bucco-lingually and build your bridge.

No. 17—J. E. McArthur. No report.

No. 18—L. B. Torrence. Two-Piece Gold Crown. A two-piece gold crown in which the buccal side of the band is swaged to fit the buccal cusps of the cap so that there is perfect occlusion as well as perfect adaptation of cusps and band. Must be seen to be appreciated.

No. 14—C. M. Smith. Clinic showing ideal inlay abutments. To supply missing bicuspid or molar it is desirable to have the anterior end free if bicuspid is supplied, and the posterior end free if molar is supplied. Always have m-o-d inlay and extend over cusps, especially in bicuspids. The m-o-d inlay when prepared for cavity as outlined above leaves only the buccal and lingual walls exposed, rendering the tooth practically immune to decay and affords the most secure attachment for a vital tooth. The advantage this type of inlay has over the proximo-occlusal type is, that it is not necessary to cut so deeply into the tooth. After inlay abutments are cast, cut cavity in inlay that is to receive free end of bridge. Cavity should resemble proximo-colusal type with slight dovetail. This can be done best with sharp burs. Take impression and bite; give inlays thin coating of wax to facilitate removal from cast; grind facing, set in position with wax, and make plaster core on buccal aspect of cast. When plaster is set, remove core and trim all that interferes with occlusion. Remove facing and all wax. Make pure gold backing for facing and wrap pure gold or platinum foil around each pin, and attach to backing with solder. Replace backing on facing, place facing in core and build up with inlay wax, extending into cavity in inlay abutment. Remove core, trim excess wax, remove from cast, remove facing, and cast. Attach to inlay with solder, cement facing, and your case is ready for patient.

No. 20—C. B. Parkinson. Temporary Denture for Anterior Bridge Cases. This denture is indicated in cases where anterior teeth are extracted and the patient objects to going without teeth while the gums are absorbing so that a bridge may properly be inserted. This plate extends only to the lingual of either teeth approximating those extracted and does not extend to the vault area but only to the necks of the teeth. By drilling two small holes mesial and distal to the teeth on either side of the extracted teeth the plate is tied in by ligatures running through these holes and tying on the labial side. This plate could be removed every few days for thorough cleaning.

No. 21—C. L. Snyder. Coping for badly decayed roots and Bridge Attachments. These cases are especially adapted to bicuspid roots where you are desirous of making porcelain faced crowns, for bridge attachments.

If the root is badly broken down and decayed, first remove all decay and if necessary put a screw post in root and build up with amalgam. Then fit band such as you would use for gold crown. Cut away the front portion of gold where the facing is to be fitted. Replace the band, seeing that the root is sufficiently cut away to allow for facing. Pack the band with temporary stopping or wax in order to obtain a good impression of root, then take impression and bite.

A very thin film of wax should be flowed over the band before running the model so that band can be easily removed from the model. Select facing and grind same to fit. Then burnish gold backing over facing. Place in position and tack it at some point with sticky wax. A small bit of investment may be used to hold band and backing together, when solder may be run around edge of backing.

Then coat facing with liquid soap and see that backing around pins is properly reinforced with inlay wax. Next place in position and build up cusps so that they articulate. Place on sprue wire, remove facings, invest and cast.

No. 22—F. E. Linder. Replacing broken facings and tipping (or not tipping) same without removing bridge. First, select facing, and after cutting the old bridge pins and occlusal edge and the broken facing left in your way, place on this selected facing two pieces of pure gold, 36-gauge, one piece to go forward over the beveled cutting edge of the facing for the tip, the other for the present hang straight out. Now cut your pins off behind these two pieces of gold and invest the facing in asbestos fibers. Flow solder on the pins then smooth with stone and place the facing on the old bridge in the mouth, fitting it to place, then take the hanging piece of gold and having it long enough to burnish it back under the lingual surface of the old bridge backing, trim and slip off and invest same as a Richmond crown, flowing gold from the tip to the upper part of the saddle backing, reinforcing same as wished, then it is finished. Take to the mouth and cement to place as a saddle backing. If it ever comes off, cement again and place a screw in the back of this through the saddle part and old backing and you have a strong enough support for bridge abutment, if needed.

No. 23—C. W. Hickman. No report.

No. 24—G. W. Dittmar. Partial Plates and Removable Bridgework. Demonstrated a variety of tenso-friction appliances in connection with removable bridges and partial plate dentures. Also showed some of the newer forms of clasps described in Dr. Coltrin's paper and the new form of the Roach Attachment.

No. 25—H. T. Methven. No clinic. Did not attend meeting.

No. 26—C. H. Bramwell. No report.

No. 27—H. M. Heggland. Movable-Removable Restorations. Showed a few steps in the construction of a movable-removable four tooth bridge according to the Chayes method on an upper right side model with the first bicuspid and first molar missing. There were three attachments used, namely: "split pin and tube" in cuspid root; "upright and jacket" in second bicuspid root, and a "bucco-lingual" attachment set in a mesio-occlusal inlay in second molar. To provide for the functional motion of the teeth, stress was broken with mesio-distal attachments between cuspid and first bicuspid, and between second bicuspid and first molar. Tissue stimulators were placed over first bicuspid and first molar. Steele's facings with cast backings were used on all four teeth.

A method was also shown for making coping-posts, that fit very accurately, and will allow of thorough burnishing of coping over the root without removing. Dr. Knoche's specially designed root reamers are used for enlarging root canals. These reamers are so constructed that a post exactly the same gauge, length and shape as reamers can easily and quickly be made, thereby insuring a perfect fit.

No. 28—W. T. Reeves. Technique of Porcelain Shell Crowns. No report.

No. 29—Lloyd F. Megaw. Table clinic—showing the complete technique of the indirect method of making a porcelain jacket crown. The requirements are (1) an impression of the prepared tooth taken in a tube which fits over the tooth, passing under the free gum margin, (2) a general impression showing several teeth on either side, (3) a "mush bite," (4) a shade guide facing matching the color of the teeth.

The technique: by packing amalgam into the tube impression a die is obtained. This die is set into place in the general impression, pouring with plaster to secure a model in which the die is in the correct relative position. The bite is then articulated. A platinum matrix is swaged on the die and the porcelain is built up on the matrix as it stands on the plaster model, over contouring to meet the shrinkage of the porcelain and completing the crown in two bakes.

No. 30—Scott P. Bowyer. (Dr. Bowyer was unable to attend the meeting but sent in the following report.) Quick method of repairing a lower plate. Wax parts together from side of plate that rests on ridge, then fill lower half of flask with plaster mixed rather thick and place plate, teeth down, and press into the plaster about one-third length of teeth and bring plaster up to the edge of plate at the break on lingual-surface. Before plaster has thoroughly set, remove plate, which can be done very easily with an old knife or an old instrument by prying up the anterior first, then on either side. With hack-saw, saw off rubber close to tooth adjacent to break, then saw off tooth that break in rubber goes through and remove rubber from this tooth by holding it in Bunsen flame till the rubber is softened. Replace plate and tooth in flask, wash with chloroform and pack with vulcanizable gutta percha, finish investment in flask and vulcanize. It is very easy to finish with large round bur after vulcanizing, as the difference in coloring of the new and old makes it easy to tell just where to trim to.

No. 31.—T. P. Donelan. No report.

No. 32—L. L. Davis. No report.

No. 33—G. E. Meyer. No clinic. Did not attend meeting.

No. 34—H. B. Pinney. No report.

No. 35—F. H. Skinner. No report.

No. 36—H. P. Bachmann. Getting rid of spongy tissue under denture. In mouths where spongy gum tissue has developed under an old denture take the old denture and line it with a modeling compound wafer and proceed as if taking a closed mouth impression and after getting it thoroughly adapted let the patient wear for a week and then repeat the operation, using fresh compound until the soft tissue is absorbed, when you will find it safe to proceed in making a new denture.

No. 37—R. C. Willett. Means of Arresting Irregularities of the Teeth and Dental-Facial Deformities.

The cases under consideration in this clinic were those ranging between the ages of two and one-half years to nine years. In dealing with a normal child we have reason to expect a certain stage of development to have been reached at a given age, but in the case of irregularities of the teeth and dental-facial deformities there has been an arrested development, and the rules that would ordinarily apply to the absorption of the roots of the deciduous teeth and the eruption of the permanent teeth do not in any way apply.

The mental age of a child is frequently measured by the S-B mental test, and the years of age from birth are not given any consideration. In a like manner, I believe, we can free ourselves of complications in considering the diagnosis and treatment in the practice of Orthodontia. For example: In the case of a boy nine years of age, upper permanent central incisors and sixth year molars erupted, lower permanent incisors partially erupted and the sixth year molars fully erupted, otherwise deciduous teeth were found in place. The lack of lateral width in both arches indicated the necessity for a radical expansion of both. The early history showed that the boy had been in one way and another afflicted and stunted in growth. Mentally he was as active as any boy of his age. Considering the boy's actual growth as compared with that of a child who enjoyed normal health, the treatment followed in expanding the arches was the same as would have been applied in the case of a child five years of age. The deciduous molars withstood the pressure applied even to the extent of opening the suture. Retaining appliances were adjusted and the second exhibit shows the permanent teeth erupting in normal occlusion and alignment.

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Another case exhibited was that of a little girl patient eight years of age. Until six years of age she had enjoyed the best of health with no interruption. But between six and eight years of age the child barely survived several attacks of bronchial pneumonia. Dentition was retarded and while the molar region presented about the same aspect as that of the first case reported, the previous normal development of the child had advanced to such a point that the same treatment was not productive of the same results.

Other cases were exhibited showing a lack of application of masticating forces, the effect upon the growth of the jaws, and the spreading apart of the deciduous teeth that would be expected in the process of normal dentition at the age of five to six years. It was evident in these cases that the children had been nourished on those foods which could be swallowed without first being prepared through mastication, and the under-development of the jaws was directly due to a lack of normal exercise.

No. 38—R. B. Blanchard. No report.

No. 39—P. A. Pyper. Non-Corrosive Iodin Broach.

A very useful broach or carrier of iodin preparations is made by taking a strip of ordinary aluminum plate about two inches long, cutting it into strips a little wider at one end than its thickness, tapering it to a blunt point at other end, file edges rounding and insert large end into broach holder or split stick. Wrapped with a little cotton or plain, it makes a splendid instrument for carrying iodin preparations into pyorrhea pockets. Being flexible it can be easily bent into best possible shape to reach any pocket. Wrapped with a larger quantity of cotton makes a splendid swab. The iodin will not corrode the aluminum, making a cheap and useful instrument.

Metal Matrices for Synthetic Cement.

A. P. DeSanno & Son makes a very finely polished steel strip. By rubbing same over paraffin, making a coating dressing, they can be used for all inter-proximal cavities and will not tarnish or discolor the cement. They are much thinner and stronger than celluloid strips—thus two strips can be inserted for two approximal cavities finishing both at same time.

No. 40—J. E. Willman. Practice Builders. Natural teeth mounted in plaster of paris blocks to avoid handling of the teeth. Teeth are ground to show root canals, illustrating difficulty of removing pulp and filling of canals. Others with cavities prepared to show necessity for extension for prevention. Teeth with curved roots and cementosis, also a model of lower teeth made five years after the first permanent molar was extracted, showing the leaning of the second molar and second bicuspid with no contact between the bicuspids—the importance of saving the first molar.

No. 41—H. F. Lotz. No report.

No. 42—R. I. Lewis. No report.

No. 43—Dr. Wm. Bebb, Curator of Museum, N. W. U. Dental School. Historical Dental Specimens.

An exhibition of Historical Dental Instruments, the main item of which was three cases (rosewood) containing instruments with pearl and ivory handles. These cases were used about 1850 and were capable of being carried about by the itinerant dentist.

A chevalier dental engine introduced about 1848, the second device for propelling a bur, was shown.

The balance of the exhibit consisted largely of dental prints and early dental journals.

FRIDAY MORNING—SURGICAL CLINICS

No. 1—T. W. Brophy. No report.

No. 2—T. L. Gilmer. No report.

No. 3—Wm. H. G. Logan. No report.

No. 4—F. B. Moorehead. No report.

(These men were called to Washington on account of war matters, hence their clinics were not given.)

No. 5—Louis Schultz. Root Resection under Conductive Anesthesia. Root resection upper first bicuspid. Roentgenogram showed close proximity of maxillary sinus. Made crescent shaped flap of gum tissue over root, removed sufficient external plate to expose buccal root, curretted out bone cavity, resected both buccal and lingual roots, smoother cavity and root ends with drills and closed wound with two catgut sutures.

PROGRESSIVE CLINICS

No. 6—A. E. Schneider. Dr. Schneider's clinic is fully described in a paper published in the May Review. It will be inserted in the volume of transactions.

No. 7—Walter Hine. No report.

No. 8—C. A. Dodge. No report.

No. 9—W. E. Harper. No clinic. Excused on account of illness.

No. 10—O. J. Graham. No clinic. Did not appear at meeting.

No. 11—Dr. Arthur E. Smith. Nerve Blocking. This was one of the progressive clinics and Dr. Smith explained in detail his technic for the various Nerve Blocking Injections. This was accomplished through the medium of a number of especially prepared wet anatomical specimens, diagrams, charts and skulls. The specimens showed all nerve branches, arteries, landmarks, etc., just as they are located in the living subject, and through their use demonstrated the technical steps for blocking any nerve branch in order to produce anesthesia for operative dentistry and oral surgery. The technic for a number of new nerve blocking injections was given, including the Intra-Oral method of blocking the second division of the Trigeminus nerve anterior to the Foramen Rotundum in the Spheno-Maxillary Fossa. His new technic for blocking the Infra-Orbital nerve simplifies the technic for this injection. He also presented his new method of blocking any tooth or teeth or section of the Superior or Inferior Maxilla by the Intra-Osseous method. The difficulties heretofore encountered in the Intra-Osseous method have been overcome. A large or small area can be blocked with a small amount of the anesthetizing solution, and yet the area of anesthesia is confined to the area to be operated upon, and without any laceration or damage to the tissue.

Results of his research work which he has been carrying out in the Pharmacology Laboratory were given. This covered the comparative toxicity of the various local anesthetics upon dogs, and a number of Kymographic tracings were shown and explained which demonstrated the action of the local anesthetics used to date upon respiration and circulation.

No. 12—K. G. Knocke. Movable Removable Bridgework that conforms to the physiological requirements of the mouth. Showing on a large model several bridges representing different types of the work. Emphasizing the necessity for parallelism of abutments and the resiliency of the attachments so as to provide individual tooth movement. Enunciating the truth that "Teeth move in function" and that all work must be constructed with this as the basis.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

A MODEL MILITARY DENTAL CLINIC.

What is probably the best equipped and most complete military dental clinic in the world is situated at Camp Borden, about sixty-five miles northwest of Toronto, Ontario. Through the courtesy of Dr. Wallace Seccombe, Editor of *Oral Health,* it was the privilege of the editor of this journal to visit this clinic in August last. Dr. Seccombe very kindly volunteered to drive the writer out from Toronto in his car, and the day was one never to be forgotten. We drove up historic Yonge street through a beautiful rolling country with splendid farms on either side, and a bracing air to put the very breath of life into our lungs. Arrived at the camp we were welcomed in a royal manner by the dental officers in charge of the clinic, notably by Captains Woollett and Semple, who, in the absence of the officer in charge of this district, Major W. G. Thompson, showed us the character of courtesy which can come only from real professional and military gentlemen. The incidents of the day, while most interesting and delightful, must give way to a statement of the nature of this clinic, and the work accomplished for the benefit of the soldiers in training. The following data were kindly furnished by Captain H. A. Semple, and are therefore perfectly authentic:

"The assistant director of dental services, M. D. 2, is Major W. G. Thompson, under whose supervision come the following dental services at—

Camp Borden,
Five convalescent hospitals,
One sanitarium,
One orthopedic hospital,
One base hospital,
Four others,

making thirteen clinics in all, with a capacity of forty chairs.

To illustrate the extent of this district, one clinic is over 800 miles from the C. A. D. C. headquarters at Camp Borden.

The highest strength during the past year was—

41 officers (graduates),
130 sergeants (laboratory men),
35 privates (dental orderlies),

making a total of 206, all ranks.

Since August 1st, 1916, approximately

24,812 new patients have been treated and made fit for service,
216,473 operations performed, including extractions, dentures, emergencies, treatments, fillings, etc.

Many cases are commenced here which are not completed before the men are moved to England.

The comfort of the N. C. O.'s and men here is greatly increased by the Ladies' Auxiliary, who have furnished a recreation tent for them, and who assist in many ways; also sending comforts overseas to men from this district.

The soldiers receive dental treatment without any charge whatever, as the Militia Department provides the supplies, and the dental officers are given the pay of their rank, the same as any other unit.

All extractions are performed under local anesthesia by a specialist.

The dentists of Toronto have presented a motor truck and a six-cylinder car for the use of Major Thompson and the C. A. D. C.

When each man's dental treatment is finished he is given a folder containing instructions on the care of the teeth and the proper method of brushing; also showing the results which follow neglect. These are presented for the use of the C. A. D. C. by the Canadian Oral-Prophylactic Association (Educational Committee of the Canadian Dental Association). They also supply a set of six cards along the same lines to each military clinic in Canada, which are hung in the waiting room.

Camp Borden Building—152 feet by 25 feet, cement stucco outside, white enamel inside, painted cement floor, 40 windows, fitted with fly screens and awnings.

Divided into—
- Orderly room,
- Main surgery,
- Quartermaster's stores,
- Laboratory,
- Waiting room,
- Private surgery,
- X-Ray room,
- Two extracting rooms,
- Two Prosthetic rooms,
- Acetylene gas plant supplying burners in laboratory,
- Boiler room supplying hot water to each chair,

Equipment for 25 chairs as follows:
- S. S. White portable chairs,
- Electric and all-cord foot engines,
- Fountain cuspidors,
- Medicine cupboards,
- Instrument tables,
- Instrument outfits with porcelain trays,
- Enameled waste pails,
- Porcelain wash basins at each chair with liquid soap containers,

Also: Electric switchboard and cabinet,
- Compressed air outfit,
- X-Ray machine,
- Electric sterilizers.

The C. A. D. C. at Camp Borden is always well up in athletics. Last year we won the relay championship of M. D. 2, the team now overseas, and has since beaten the best relay teams in England. Our baseball team played in the final for the camp championship this year, losing by one run in ten innings."

Aside from the statistical data of this statement, which are very interesting in themselves, the thing of greatest significance is the spirit manifested in the entire Dental Corps. It is a revelation to visit this clinic and see what is being accomplished, and more particularly to note the *esprit de corps* which exists among the members of the Unit. It will be remembered that in the Canadian army the dentists are accorded separate status with suitable rank, and this in a concrete way is accountable for the large measure of success attained by the Unit. In no other way could the work of making so many of the soldiers dentally fit for service have been carried out. There is a business-like directness in delivering the service to the men which eliminates useless red tape, and makes the Unit most effective. It is in striking contrast to the conditions in other countries—the United States for instance—where dental service in the army is under the direction of the Army Medical Corps. Rank counts with telling force, and no corps can operate to its fullest efficiency without suitable rank. The United States military authorities would do well to investigate the work done by the Canadian Army Dental Corps, and profit thereby.

No one can visit the clinic at Camp Borden without being impressed with the efficiency of the system, as well as with the personnel of the men. Major Thompson is worshipped by his subordinates, and there is a loyalty and comradship that is most refreshing. Not only this but the commander of the camp, General Logie, is in full sympathy with the aims of Major Thompson and the C. A. D. C., and does all in his power to make their work more effective. He graciously received Dr. Seccombe and the writer at his headquarters in the most cordial and informal way, and took occasion to express his great gratification at the work accomplished by the Dental Unit.

To see this clinic, to mingle with the officers and men, and to take note of what is being accomplished, is to make any dentist proud of his calling, and compel his gratitude that in this instance at least dentistry is coming to its own.

THE STATUS OF DRAFTED DENTAL STUDENTS.

Shortly after the entrance of the United States in the war it was announced on apparently good authority in Washington that it was the desire of the Surgeon General's office and the War Department that all medical and dental students should continue their studies, and that they would not be called into service until after graduation. This was on the manifest ground that trained men in medicine and dentistry were needed to care for the military and civil population, and that if students were taken out of college and made into soldiers of the line the result would be that in the near future there would be much suffering both in the army and in civil life due to lack of adequate professional service on account of scarcity of trained men.

This scarcity in the dental ranks was beginning to be apparent even before the war, attention having been called to this fact in an editorial in the July, 1917, number of this journal. Everything pointed to the necessity for training more men for dental service instead of diverting them from their professional studies and forcing them into other branches of the military. This seemed the logical and constructive thing to do. It was not a matter of evasion of service on the part of the young men, but of placing them in the particular kind of service where they could be of the greatest value in the present emergency.

But after the registration for the draft the War Department apparently became concerned over the question of class exemptions, and announced that no exemptions would be made except those provided by law. Immediately pressure was brought to bear by the medical profession, and after extended argument an order was issued by General Crowder on August 29, 1917, that hospital interns, and fourth, third and second year medical students who were called into service might enlist in the Enlisted Reserve Corps (Regulations for the Enlisted Reserve Corps, Act of June 3, 1916), and permitted to complete their course. This act does not grant exemption. It holds the men in the Reserve Corps, subject to call.

It was generally presumed that the dental service was considered a valuable and necessary part of the medical service of the army and that dental students would be included in such an order. It was therefore a surprise to both physicians and dentists throughout the country that dental students were omitted.

There can be no question of doubt that there exists today a greater scarcity of dentists than of medical men, and the need will be felt more and more as time goes on.

While practically every argument which has been presented favoring the temporary exemption of medical students applies to dental students as well, the following information has been gathered by the Committee of the Deans of the Dental Colleges of the United

States for those who may be interested, as applying more especially to dental students.

There is no legal obstacle to the issuance of an order for dental students, similar to that issued for medical students. The regulation specifies that "Engineer, Signal and Quartermasters Corps and the Ordnance and Medical Departments of the Regular Army" may have such Enlisted Reserve Corps. As the army dental service is one of the medical departments, it might be included in such an order. Attention is called to the fact that the issuance of such an order would not "let down the bars" to an endless line of similar orders as the regulations referred to apply to but the three corps and two departments above mentioned.

The effect of the draft on dental students unless temporary exemption is accorded, will, in addition to the inauguration of the four year course which begins with the coming college session, so deplete the ranks of dentists as to make the number altogether inadequate to meet the necessities of the situation both military and civil.

A careful estimate by the Committee of Deans of Dental Colleges furnishes the following data:

The number of graduates from all of the dental schools of the United States for the past five years was as follows:

1913	2,022
1914	2,254
1915	2,388
1916	2,835
1917	2,989
Total	12,488

This is an average of 2,497 per year.

The best estimate that can now be made for the next five years is as follows:

1918	2,319
1919	1,767
1920	practically none
1921	1,000
1922	800
Total	5,886

This is an average of 1,177 per year.

It is thus apparent that the effect of the draft will be to reduce the number of graduates for the next five years to about one-half the number graduated during the past five years, and it will necessarily be four years after the close of the war before the graduating classes will begin to increase again in numbers.

As it is today the ratio of army dentists is inadequate. The government provides for one dental surgeon to every one thousand enlisted men, but those familiar with the situation know that even in civil life with all of the conveniences of the modern dental office it is impossible for one dentist to properly care for the average one thousand civilians each year. How much more impossible then is it for the army dental surgeon, handicapped as he is by the exigencies incident to warfare, to properly care for one thousand enlisted men. This fact is so patent on its face that at present a bill is being prepared for presentation to Congress providing for an increase of army dentists in the ratio of one dental surgeon to 500 men in the army. This is constructive legislation of the highest order, but of what avail will the provision be if the War Department takes such steps as to prevent the preparation of men in sufficient numbers to fill the legalized quota?

It is not as if the value of dental service in the army had not already been amply demonstrated. We have it from the very highest governmental authority in Canada that by virtue of the work of the Canadian Army Dental Corps there are at least 60,000 men serving at the front who, without this service, would have been incapacitated for duty. This is in an army of less than 500,000 men. It requires only a little figuring to prove what adequate dental service can do for the United States Army.

In fact up to date the dental profession of the United States have shown a fine spirit of patriotism in preparing many men gratuitously for military service who would not otherwise have been able to qualify, thus demonstrating the value of their work. The dental colleges have thrown open their clinics, private dentists have done work in their offices, and the Preparedness League of American Dentists, with a membership of several thousand, have all combined to make dentally fit many of the enlisted men. This has been done without a penny of expense to the men or the government. By this gratuitous service the dental profession has made possible the enlistment of several times the number of men (who would otherwise have been rejected) that will be called from the dental schools by the draft.

The War Department is showing a commendable spirit of paternalism in conserving the physical and moral welfare of the men in most of its provisions, and we feel sure that it merely remains for it to become thoroughly familiar with the situation with respect to dental students to have it grant permission for these young men to complete their work in college, and thus prepare themselves for the highest class of service of which they are capable.

THE EDITOR'S DESK.

"MISS ALICE." (A Tribute.)

In the December, 1907, number of the Dental Review, in the "Editor's Desk" department, I published an article entitled "A Little Girl," which ran as follows:

> I know a little girl who has been assistant in one dental office continuously for nearly twenty-three years. You will probably say that this cannot be—that if she has been in an office for that length of time she can no longer be a little girl, but there you are mistaken. There are some people who are superior to time. The years have no effect on them except to make them better, purer, broader-minded, and altogether more efficient. These people are most happy, and let me tell you that every individual has it in his power to secure this kind of happiness. It is all a matter of faithful service—service to an employer, to employees, to patients, to clients, to one's family, to humanity. If every boy and girl could be taught this sublime lesson and live up to it the world would be infinitely better. There would hardly be need for any other gospel. The gospel of loving service, of work, of devotion to duty, though the heavens fall, is the one to regenerate the world.
>
> And this little girl has that gospel, and she practices it every day—though she never preaches to any one. There is sometimes a deal of difference between practicing and preaching.
>
> The most pronounced characteristic of this little girl's service is her loyalty. She is true as steel to the interests of her employer, and no one ever did him a wrong that she did not try to right. I used the word "employer," but that was a mistake. No one employs this little girl. She simply helps the dentist conduct his practice and there is a community of interest in that office which has long since broken down all the barriers of business and developed a spirit of reciprocal service which is most delightful. The idea of the dentist's interests not being her interests never enters her head, and she is more alive to his welfare than he is himself. Nor does her loyalty stop here. Of course I have, fortunately, never seen the matter tested, but I verily believe she would lay down her life for any member of the dentist's family. His children have always been her especial pets, and in turn they would

defend her at the drop of the hat, or even before the hat had a chance to drop.

Such then is this little girl's position. In all those twenty-three years there has never a harsh or impatient word passed between her and the dentist, and there never will. The only difference of opinion has been about salary and vacation—two things which cause so much disturbance in the business world. The dentist has from time to time raised her salary, but always under protest from the little girl. She has the unique idea that she is getting enough, when as a matter of fact, she would not get enough if she had all the dentist ever earned. Such service as hers cannot be paid for in coin of the realm, though it has often been a sore trial to the dentist to make her accept a modicum of what he thought she ought to have. As for vacations, she absolutely spurns them. When remonstrated with in the matter and urged to run away some place for a rest, she simply smiles a bit indulgently, but ends by having her own way. Her theory is probably correct that the office would not get along very well without her, but the astounding thing is that she claims to take more comfort there than any place. And yet, after all, is not this only another proof of the fact that wherever duty is best performed there is the greatest happiness?

Why am I writing all this? Not surely to parade a personal matter before the world, but to point a moral. This little girl's example would do well for the great mass of humanity to go by. Her creed is so simple and so effective. It is a "Sane Fourth" creed, not much noise about it, but plenty of enthusiasm. It consists chiefly of fidelity, patience, rock-bottom honesty, cheerfulness, modesty, helpfulness, generosity, loyalty and—more loyalty.

I have seen one of the most noted women of the world pin an ornament on the little girl's waist in token of her appreciation and esteem; I have seen the highest cultured and most refined show her unstinted deference and respect, but I never saw the little girl's head turned for a single instant. That is brain power for you. It is evidence of strength of character to be able to withstand the subtle influence of flattery, and the truly great in the world are always modest. This little girl is one of the truly great. She has never betrayed a trust and has always lived up to the highest of her possibilities. That epitomizes greatness, if I know what greatness is.

If you would like to see this little girl, call at my office. You will always find her there.

This was written nearly ten years ago, and now if you call at my office you will not find the "little girl" there any more. On August 15th, 1917, "Miss Alice," as everybody called her, quietly lay down her duties and passed serenely to the silent beyond. Her life was an example to every man, woman and child in the world. The highest function that any individual can perform is that of faithful service, and perpetual devotion to duty.

Miss Alice was the most conspicuous example of this that I have ever known. She was in my office for thirty-two years, and in all that time there never crossed my mind the slightest suspicion of doubt of her perfect loyalty. She was unselfish in the highest degree, sacrificing always for others and taking a delight in doing it. For herself she asked nothing—nothing but the joy of helping.

Her pleasures were of the simplest kind, and therefore she had many of them. She loved birds, and birds were attracted to her; she loved flowers, and flowers grew for her as for no one else.

Sensitive in the highest degree to censure or blame, she would willingly accept both rather than defend herself by exposing others. She suffered many a pang in silence when a word of truth from her lips would have shielded her.

She was heroic to an exalted extent. In those thirty-two years she was never out of my office a day on account of illness till the final, fatal illness came; and yet there must have been many times when it cost her endless effort to be at her post. No one ever knew she was ill till the evidence was unmistakable. She never complained.

If I could write an accurate story of the life and devotion of this girl, it would be the greatest sermon ever penned—not only for the material good she did in the world, but for the example she set. And so I say again it is for this example that I am venturing to bring a personal matter before my readers. It is not that I wish to "hang my heart on my sleeve and parade it before the people," but that the life of Miss Alice, if studied and followed, would make the world a better place.

To my family and to me her loss is irreparable, and it impresses me as the strangest experience of my life. Somehow I had always felt that Alice would live long after I was gone, and that when my final summons came she would be there to gather up the loose ends, and see that my affairs were kept straight. She was always doing that. But the freaks of fate have willed it otherwise, and they have heaped upon me the added sorrow that as I write these lines on this day of all days, I am detained more than 500 miles from the spot where they are laying her peacefully away. All that is left for me to do is to pay a tender tribute to her memory, and to pledge myself to live a better life because she lived.

In the realm where birds sing sweetest; where flowers bloom brightest; where hearts are pure and true; where loyalty is king, and devotion reigns supreme; where the incense from good and noble deeds dispels the dross of doubt and fear; where hope, and happiness, and truth, and joy, and faith, and love make a heaven all their own—there dwells the spirit of Miss Alice.

C. N. Johnson.

BOOK REVIEWS.

A Manual of Anatomy. By Henry E. Radasch, M. Sc., M. D., Assistant Professor of Histology and Embryology in the Jefferson Medical College, Philadelphia. Octavo of 489 pages with 329 illustrations. Philadelphia and London: W. B. Saunders Company. 1917. Cloth $3.50 net.

It would seem as if nothing new could be said on the subject of anatomy, and yet each work that is brought out has something characteristic which commends it to the student. In the present book the arrangement is somewhat different from most other works in anatomy. "The external anatomy is continued from one segment to another, uninterruptedly, and the histology is taken up in the same manner. In this way the student has a more connected idea of the parts and their relations to one another. In addition the various pathways are given separate and rather full consideration, so that impulses may be traced, in a connected manner, from origin to termination." This is an important feature of the work which must commend itself to every reader. There is one term connected with the teeth which the author should, in a subsequent edition, eliminate. This refers to the use of the word "canine" when describing the cuspid tooth. Why authors should cling to the dog-like term in designating this tooth it is difficult to understand. It should be "cuspid" and the two teeth posterior to it should be called "bicuspid." The work as a whole is exceedingly well prepared, and the publishers have co-operated with the author to bring out a work in every way most worthy.

Applied Anatomy and Oral Surgery for Dental Students. By Robert H. Ivy, M. D., D. D. S., Assistant Surgeon Columbia Hospital, Milwaukee; former Assistant Surgeon, University of Pennsylvania Hospital; former instructor in Oral Surgery University of Pennsylvania; Second Edition Thoroughly Revised. 12mo of 290 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1917. Price, Cloth, $1.75 net.

When Dr. Ivy undertakes to write upon a subject it is well done. The present volume will enable the student to go over the subject in the most expeditious manner, and in a very consecutive order. At the end of each chapter there is a list of "Review Questions," which furnishes a ready means of committing the ideas to memory, and makes reviewing the subject very easy. The profession is under obligation to the author for bringing out a work which contains the greatest amount of information in the fewest possible words.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

A Hint on Partial Lower Dentures:—Partial lower dentures supplying some or all of the bicuspids and molars sooner or later, on account of the absorption of the alveolar process, settle to such extent that the teeth of the denture do not reach up to and occlude with the teeth of the upper set.

Any attachments used for retaining the lower partial denture should be so constructed that they will adapt themselves to such changes as are caused by the absorption of the alveolar process.

The following method for raising the lower partial denture so that the teeth of the denture will properly occlude with the upper set will be found to be practical and easy of accomplishment.

Drill numerous holes into those parts of the denture that rest upon the gum, then place one or more sheets of wax over those surfaces, according to the amount of absorption that has taken place, then warm the wax in hot water to soften it, and place in the mouth and tell the patient to bite, bringing the teeth of the denture into proper occlusion with the upper set. Then cool the wax while in the mouth, and remove and trim off the surplus wax, then flask the case upside down and vulcanize rubber in place of the wax which will restore the denture to its original position in the mouth.—*H. A. Cross, Chicago.*

Make a Survey of the Mouth:—Before you begin to operate make a good general survey of the whole mouth by lifting up and out the lips and cheeks so you can get a clean view of the entire oral cavity. As a rule the patient comes simply because of a troubling tooth, but in reality the whole masticatory apparatus needs reconstructing, so don't begin to operate on the troubling tooth until you see, and have made up your mind as to what the whole mouth really needs. By so doing you will not only benefit the patient, but you will also enhance the value of your services in the eyes of your patient.—*W. O. Fellman, Oak Park, Ill.*

Finishing Occlusal Surfaces:—To polish deep grooves in inlays, cast crowns or dummies, employ dull fissure or round burs in the engine; after which a beautiful finish may be secured by following with a small brush wheel, charged with polishing material.—*N. R. Smeltzer, Chicago.*

To Reduce the High Cost of Bridge Work:—After backings have been adapted to Richmond facings, cut off the projecting pins, flush with the backing; split the remaining stump longitudinally with a sharp knife. This minimizes the danger of checked facings and saves 8-12 cents per tooth in platinum.—*P. G. Puterbaugh, Chicago, Ill.*

Treatment Broaches:—After a barbed broach has become useless as such remove the barbs by drawing the barbed end through the beaks of a pair of pliers, and you have a good treatment broach. —*R. E. Light, Chicago, Ill.*

Repairing Faulty Porcelain Inlays:—75/100 platinum, gauge 1/2000 burnished to margins of cavity preparations, and using a lower fusing porcelain, will repair faulty inlay and procelain jacket crown margins.—*H. E. Turnquist, Minneapolis, Minn.*

Make Gold Clean Before Casting:—Many castings are ruined because the gold used is not clean. Make it an absolute rule to clean each piece of gold with equal parts of potassium nitrate and borax before it is used. Clean gold is active, vivacious if you please, whereas dirty gold is sluggish and will never give a sharp casting.—*O. de F. Davis, Minneapolis, Minn.*

Wax Patterns for Inlays:—In making wax patterns for compound cavities the contact point should be disregarded until wax is thoroughly adapted to gingival, buccal, and lingual surfaces by the use of thin strips. Then add small amounts of hot wax until contact is gained. After inlay is polished and is found deficient at contact a small piece of 18k. solder sweated on will quickly restore it.—*Victor H. Fuqua, Chicago, Ill.*

Taggart Inlay Rings:—If made of brass, as mine are, may be readily cleaned by placing them in 20 per cent sulphuric acid for a few moments, after having first washed them as clean as possible with clean water.—*Homer Almon.*

Sterilize Your Cavities:—In all cavities, that are to be filled with amalgam, cleanse with absolute alcohol and dry first; then paint entire cavity with tincture of iodin; dry thoroughly and insert your amalgam at once.—*Frank L. Miller, London Mills, Ill.*

MEMORANDA

TEXAS STATE BOARD OF EXAMINERS.

The Texas State Board of Dental Examiners will hold its next examination in Dallas, Texas, beginning Monday, December 17th, 1917. No diplomas exchanged, no reciprocity. All application blanks accompanied by the fee of $25.00 should be in the hands of the Secretary not later than December 12th. For further particulars and application blanks address Harrison B. Cave, Secretary, 810-14 Wilson Building, Dallas, Texas.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next session of the Michigan State Board of Dental Examiners for the examination of candidates wishing to practice dentistry in the State of Michigan, will be held in the city of Ann Arbor (Dental College Building) the week of November 5th to 10th, inclusive. Applications should be made early as all preliminaries must be complete and in the hands of the secretary not less than ten (10) days prior to the examination. Photographs and itemized preliminary educational qualifications required of all candidates. For all further information address, E. O. Gillespie, Secretary-Treasurer, Stephenson, Mich.

ARIZONA STATE BOARD OF DENTAL EXAMINERS TO CONVENE.

The next examination by the Board of Dental Examiners of Arizona, for a license to practice dentistry in the state, will be held in Phoenix beginning on the eighth day of October, 1917, at 9 a. m. Examination fee of $25.00 and sworn statement of candidate's qualifications on a blank furnished by the Secretary of State of Arizona should be in the hands of the Secretary of State at least twenty days before examination. The Secretary of the Board will answer any letter of inquiry, but your application and fee should be sent to the Secretary of State. Eugene McGuire, D. M. D., Secretary, 202-203 Noll Bldg., Phoenix, Arizona.

NATIONAL DENTAL ASSOCIATION—TRANSPORTATION ARRANGEMENTS TO TWENTY-FIRST ANNUAL SESSION—NEW YORK, N. Y., OCTOBER 22-26,1917.

Those who are going to New York for the National Dental Association meeting October 22nd to 26th are urged to consult the local ticket agent at their home town for complete information regarding fares, time limits and stop-over privileges in connection with the trip. There is on file in every ticket office the tariff schedule which officially informs local agents of the rates from that point.

You should not leave the determination of the route desired until just before you are ready to start on the trip. Local Ticket Agents may have to obtain special tickets for this occasion from their general offices, and you must therefore notify them in time so that the tickets will be available when you are ready to commence your journey.

From various points in the United States, passenger associations have announced special rates as follows:

Central Passenger Association: This comprises the territory of the lower peninsula of the State of Michigan. All territory as far South as the Ohio River, as far East as Buffalo and Pittsburgh, and as far West as a direct line drawn between St. Louis and Chicago. Two cents per mile in each direction. Signature form of tickets will be sold October 19th, 20th, and 21st, final return limit to reach the original starting point not later than midnight, October 30th. A joint tariff authorizing fares for the annual session of the Association from points in the Central Passenger Association territory has been compiled.

For your information, I am giving you herewith, round-trip rates authorized for our meeting from the principal points in the Central Passenger Association territory to New York and return.

Battle Creek, Mich.	$29.25
Bay City, Mich.	28.00
Chicago, Ill.	36.30
Cincinnati, Ohio	30.10
Cleveland, Ohio	22.90
Columbus, Ohio	25.30
Dayton, Ohio	28.10
Detroit, Mich.	26.50
Grand Rapids, Mich.	30.55
Indianapolis, Ind.	32.50
Jackson, Mich.	27.45
Kalamazoo, Mich.	30.15
Saginaw, Mich.	27.50
South Bend, Ind.	32.10
Springfield, Ohio	27.10
St. Louis, Mo.	42.20
Terre Haute, Ind.	35.40
Toledo, Ohio	26.50

The Trunk Line Association: This serves most of New York, Pennsylvania, New Jersey, Delaware, Maryland and West Virginia, also a part of Virginia, and announces that there will be available for those attending the coming session of the National Dental Association, a railroad rate of two cents per mile in each direction with a minimum of $1.00 for the round trip on the certificate plan, going and returning via the same route only. Going tickets in connection with certificates to be sold October 19th, 20th and 21st at one-way fares applicable to New York City on the certificate plan. These certificates must be obtained from the Ticket Agent at the starting point, and to be valid for the reduced fares returning, must be endorsed by the Secretary of the National Dental Association, indicating that the holder has been in attendance at the meeting and is entitled to the reduction, and must also be validated by a special agent on either October 24th, 25th or 26th. Return tickets will be sold on presentation of validated certificates. October 24th-29th at the difference between the fares paid on the going trip and the fares for the round trip; these latter tickets to be limited to continuous passage to destination, which must be reached in no case later than October 30th.

New England Passenger Association: Two cents per mile in each direction, short line mileage, going and returning via same route, and that one over which one-way tickets are regularly sold, and only from points where regular one-way fare to New York City is over $1.00. Tickets to be sold or certificates issued and good going October 19th, 20th and 21st, and returning to reach original starting point not later than midnight of October 30th.

Trans-Continental Passenger Association: Summer rate tickets from North Pacific Coast points may be purchased as late as September 29th, return limit October 31st.

Chicago and return	$ 80.00
St. Louis and return	77.50
New York and return	118.20

Regular nine months excursion fares, approximating two cents per mile in each direction, are in effect daily from California and North Pacific Coast points.

From California to Chicago and return	$110.00
From California to St. Louis and return	103.00
From North Pacific points, Chicago and return	109.00
From North Pacific points, St. Louis and return	103.50

Western Passenger Association and Southwestern Passenger Association: To members located in this Association which comprises practically all the territory West, Northwest and Southwest of Chicago, wish to advise that no special rates have been announced, and you should therefore consult your Local Ticket Agent regarding fares from your home city, and where possible to do so, arrange to purchase your tickets through unless you find that by purchasing tickets from your home town to St. Louis or Chicago, that you can then repurchase, taking advantage of the special rates from these points as shown in previous paragraph to New York City and return.

SPECIAL TRAIN FROM CHICAGO.

For the accommodation of those going to the National Dental Association meeting to be held in New York, October 22-26, 1917, arrangements have been made with the Michigan Central Railroad to operate the "National Dental Association Special" leaving Chicago from the Michigan Central Station, Twelfth street and Michigan avenue, at 5:40 p. m., Saturday, October 20th. This will be an all Pullman train consisting of club car, compartment car, standard sleepers, observation car and dining cars. The train will make intermediate stops on the Michigan Central at Kalamazoo, Mich., at 8:52 p. m., Battle Creek, at 9:26 p. m., Jackson, Mich., at 10:24 p. m., Ann Arbor, Mich., at 11:14 p. m., and Detroit, Mich., at 12:01 midnight, and is scheduled to arrive in Niagara Falls at 7:25 a. m., Sunday, October 21st, where our train will be parked so that we may occupy our cars at any time during the day. The entire day may be spent visiting the various points of interest at Niagara Falls.

The Pullman fares from Chicago to New York including the occupancy of our cars if desired at Niagara Falls are $6.00 for lower berth, $4.80 for upper berth, $17.00 for compartment and $21.00 for drawing room.

Arrangements will be made with one of the principal hotels at Niagara

Falls to serve breakfast. The special train will leave Niagara Falls at 7:20 p. m. Sunday, October 21st, and will arrive in New York, 7:50 a. m., Monday, October 22nd, in ample time for the opening of our Convention.

The advantages of these special arrangements are many. They permit leaving Chicago at the close of the business day, Saturday, spend an entire day at Niagara Falls and still arrive in New York at a convenient hour on Monday morning. It also gives us an opportunity of renewing old acquaintances and making new ones en route. Those desiring to use the "Special" from Chicago going through to New York direct without stopping over at Niagara Falls can do so, arriving at New York at 5:30 p. m., Sunday, October 21st, by paying excess of $5.00 account fast time.

When purchasing your tickets, make sure that they read East of Chicago via the Michigan Central to Buffalo, N. Y. C. to New York. Account fast time, an excess fare of $5.00 will be charged on all tickets reading from Chicago to New York on this train, but to those stopping over at Niagara Falls, this excess will be refunded on presentation of tickets to the Depot Ticket Agents at Niagara Falls.

For detailed information, consult any agent of the Michigan Central Railroad or write to Mr. Fred E. Deal, City Passenger Agent, Michigan Central Railroad, 228 South Clark street, Chicago.

Let us get together this year and make this the best Convention ever held by our Association, and also try as far as possible to travel on the special train as outlined above.

COMMITTEE ON TRANSPORTATION,
D. C. BACON, Chairman.

NEBRASKA BOARD OF DENTAL SECRETARIES.

The Nebraska Board of Dental Examiners will hold a regular meeting in Omaha, November 6-7-8-9, at the Creighton Dental College. For information address Dr. S. A. Allen, Sec'y, Loup City, Nebr.

PSI OMEGA FRATERNITY.

All members of Psi Omega attending the National Dental Association will find headquarters provided at the Hotel Astor during the week of the convention. *Please register immediately upon arrival.* The annual meeting and banquet of the Fraternity will be held at the Hotel Astor, Friday evening, October 26th, 1917. H. M. Potter, Secretary, Reception Committee.

THE NORTHERN ILLINOIS DENTAL SOCIETY.

The thirtieth annual meeting of the Northern Illinois Dental Society will be held Wednesday and Thursday, October 17th and 18th, at Dixon. Mark off the dates in your appointment book and bring your dental acquaintances with you. C. L. Smith, Secy.

MILITARY DENTAL SOCIETY FORMED BY OFFICERS DENTAL RESERVE CORPS, CAMP GRANT, ROCKFORD, ILL., SEPTEMBER 17, 1917.

The Members of the Dental Reserve Corps of Camp Grant, Rockford, Ill., met on September 17, 1917, for the purpose of organizing a Dental Society. The aim of this society is to arrange for papers on dental and closely allied medical subjects for the instructions of its members, as well as to arrange for musical and other entertainment. It is hoped this move will be general among the dental surgeons of all army camps in the United States so that it will become a national association of dental societies for mutual benefit.

Further announcements will appear later.

OFFICERS AND MEMBERS.

Honorary president, Capt. H. O. Scott, U. S. A.; president, 1st Lt. C. A. Patterson, U. S. R.; vice-president, 1st Lt. John P. Garriott, U. S. R.; secretary, 1st Lt. Geo. L. Felcher, U. S. R.; treasurer, 1st Lt. H. F. Bohle, U. S. R.; publicity correspondent, 1st Lt. E. A. Heinz, U. S. R.; 1st Lt. A. M. Aronberg, U. S. R.; 1st Lt. R. A. Adkins, U. S. R.; 1st Lt. S. G. Ewen, U. S. R.; 1st Lt. F. W. Gale, U. S. R. 1st Lt. J. C. Gallagher, U. S. R.; 1st Lt. P. W. Clopper, U. S. R.; 1st Lt. H. E. Haines, U. S. R.; 1st Lt. H. W. Hennis, U. S. R.; 1st Lt. C. H. Hatch, U. S. R.; 1st Lt. Otto Kolar, U. S. R.; 1st Lt. Stanley B. LaDue, U. S. R.; 1st Lt. C. L. Lane, U. S. R.; 1st Lt. J. L. Meredith, U. S. R.; 1st Lt. H. R. Newton, U. S. R.; 1st Lt. J. A. Rapp, U. S. R.; 1st Lt. K. F. Smith, U. S. R.; 1st Lt. P. H. Plummer, U. S. R.; 1st Lt. E. F. Sullivan, U. S. R.; 1st Lt. C. D. Washburn, U. S. R.; 1st Lt. Arthur C. Wood, U. S. R.

ONE HUNDRED VACANCIES IN THE DENTAL CORPS.

1. The Surgeon General of the Army announces that there are, at the present time. approximately 100 vacancies in the Dental Corps, and that examinations for the appointment of dental surgeons will be held at Ft. Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado; Fort McDowell, California, and Ft. Sam Houston, Texas, on Monday, November 12, 1917.

2. Application blanks and full information concerning these examinations can be procured by addressing "Surgeon General, U. S. Army, Washington, D. C."

3. The Dental Corps is one of the constituent members of the Medical Department of the Army. It consists entirely of officers, who are commissioned as dental surgeons. Appointments therein are authorized at the rate of 1 for each 1,000 enlisted men of the line of the Army. During the first 8 years of their service, dental surgeons have the rank, pay and allowances of first lieutenants. After 8 years they have the rank, pay and allowances of captains, and after 24 years the rank, pay and allowances of majors; subject, however, to such examination prior to advancement as the President may prescribe, and to the proviso that the number of dental surgeons with the rank of major shall not at any time exceed 15.

4. No applicant may under existing law be commissioned in the Dental Corps unless he is between 21 and 32 years of age, a citizen of the United States, a graduate of a standard dental college, and of good moral character, nor unless he shall pass the usual physical examination required for appointment in the Medical Corps, and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects of a standard dental college course. Whether or not the applicant is married has no effect upon his eligibility for the Dental Corps.

5. Application for appointment must be made in writing to the Surgeon General of the Army, upon the prescribed blank form. All the interrogatories on the blank must be fully answered. In compliance with the instructions thereon, the application must be accompanied by testimonials, based upon personal acquaintance, from at least two reputable persons, as to the applicant's citizenship, character and habits.

The selection of the candidates is made by the Surgeon General from the applications submitted, and a formal invitation to report for examination to the most convenient examining board in each case will be issued by him.

6. The examinations are conducted under instructions from the Surgeon General and usually last six days. No allowances can be made for the expenses of applicants undergoing examination, whether incurred in travel to

and from or during their stay at the place of examination, as public funds are not available for the payment of such expenses.

Each applicant, upon presenting himself to the board, will, prior to his physical examination, be required to submit his diploma as a graduate of a standard dental college. Should he fail to do so the examination will not proceed.

7. To each commissioned rank in the Army is attached a fixed annual salary, which is received in monthly payments, and this is increased by 10 per cent for each period of 5 years until a maximum of 40 per cent is reached. A dental surgeon with the rank of first lieutenant receievs $2,000 per annum, or $166.66 monthly, during his first 5 years' service. At the end of 5 years his annual pay is increased to $2,200 or $183.33 a month. At the end of 8 years he is advanced to captain and receives $2,400 a year, plus 10 per cent for his first 5 years' service, making $2,640, or $220 a month; and thereafter his annual pay is—at the end of 10 years, $2,880, or $240 a month; at the end of 15 years, $3,120, or $260 a month; at the end of 20 years, $3,360, or $280 a month. At the end of 24 years he is advanced to major and receives $4,000 a year, that being the pay of his grade, $3,000 plus increase for prior service of 20 years up to $4,000 which is the maximum allowed by law to a major. In addition to their pay proper, they are furnished with a liberal allowance of quarters according to rank, either in kind, or where no suitable Government building is available, by commutation. Fuel and light therefor are also provided. When traveling on duty an officer receives mileage for the distance traveled. On change of station he is entitled to transportation of professional books, and papers and a reasonable amount of baggage at Government expense. Groceries and other articles for their own use may be purchased from the quartermaster at about wholesale cost prices. Dental Surgeons are entitled to medical attendance and hospital treatment without charge other than for subsistence.

8. Officers of the Dental Corps are entitled to the privilege of retirement after 40 years' service, or at any time for disability incurred in the line of duty. On attaining the age of 64, they are placed on the retired list by operation of law. Retired officers receive three-fourths of the pay of their rank (salary and increase) at the time of retirement.

9. In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon the intending applicants.

THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, NOVEMBER, 1917 No. 11

ORAL FOCI OF INFECTION.

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO, ILL.

So much has been written on this subject of late that instead of its leading to a clearer understanding of the matter it has resulted in much confusion and the production of wrong impressions. I feel that perhaps a systematic consideration of the subject might at least lead to a more scientific basis of investigation. It is not my purpose to attempt to discuss all of the possible angles of foci of infection, but I will confine my remarks to the two principal sources of oral infections the ones usually referred to when speaking of oral foci of infection, namely, pyorrhea pockets and infectious blind alveolar abscesses.

The first question that naturally comes to our mind is (even before taking up any consideration of the two main divisions as suggested) are oral foci of infection really of baneful systemic influence? On the whole I don't think there can be any great doubt in the minds of medically trained men on that score, at least not as to the question in general; however, there might be a good deal of difference of opinion as to the severity of the results from these sources. For the present let us be content with the acceptance of the fact that oral foci of infection may have deleterious influences on the general system and we shall come back to the degree of their harmful effects in that direction later on.

The next main question that presents itself is: Are these two groups really always sources of infection or foci of infection? Does the X-ray picture (after proper interpretation and finding that one of these above conditions actually exists) necessarily *always* mean that we have an oral focus of infection present? We shall dilate on these latter two questions in detail after taking up the consideration of the two main chapters separately, as we must on account of their radical differences. I believe that while in most instances the last question, namely: Are blind abscesses and pyorrhea pockets really infectious foci? is answered usually in the affirmative, there is no means as yet which gives any clear *proof* for the general acceptance of this belief. I admit that the theory, that such conditions are *foci of infection* to a degree, is true; nevertheless, exceptions to such findings may well be taken, owing to the fact that our methods of investigation so far in laboratory experimentation are not at all analogous to what actually occurs in the human body. It is easy to criticize these laboratory methods, of course, but much more difficult to suggest a better way, but there *is* room for doubt in accepting statements based on findings which are only in slight manner similar to what actually occurs in the human body.

The pathogenicity of organisms as they are used in laboratory experimentation in animals is, of course, very different from their pathogenicity in man. The methods by which these organisms are introduced into animals in laboratory working is entirely different from the manner in which they or their toxins are taken up in the human subject, and this again leaves much ground for criticism in drawing similar deductions from animal experimental work on one side and the natural results in the human system on the other. To introduce a syringe full of an emulsion of bacteria into the abdomen or the earvein of a rabbit, directly into the circulation, is surely not in any way similar to the gradual process of absorption, which takes place in the human subject, where such organisms are obliged to pass through the scrutinizing forces of lymphglands and are immediately fought on all sides by the resistive powers of the individual. In the animal such a quantity of material is immediately thrown directly into the system that all bodily defensive powers are entirely swept aside.

The degree of virulency of the bacteria introduced in such manner also is different from the organisms growing in man, so here again much difference of opinion might well arise. The degree of tolerance by the animal is also a factor to be considered. There are many phases of our laboratory work that the scientific thinker may well take exception to, and while at present they are the best methods we have there still is left quite a chance that our ideas on the subject may at some future time be very much modified, when some wise man will give us more truly scientific ways of investigation.

Allow me to present a table showing the unreliability of our present day laboratory experimental methods so far as drawing deductions goes, with reference to human beings. We injected into the ear vein of seventeen rabbits an emulsion of streptococcus viridens obtained from seventeen different blind abscesses from the mouths of seventeen different patients with the following results: Upon autopsy eight of these rabbits showed the streptococcus in the kneejoints of the rabbits. Now of these eight streptoccous viridens seven of the granuloma were in the mouths of patients who did not suffer from rheumatism and from one who was afflicted with the disease. Nine, of the rabbits, had no joint lesions and the streptococcus was not recovered in the kneejoints. Of these granulomas used for this second set of experiments, *four* were obtained from patients *with* rheumatism and five of the patients had no rheumatism. These results certainly do not confirm the findings as to selectivity arrived at by Rosenow and in no way at all show the baneful results of streptococci in blind abscesses in the human subject.

I believe, however, that our theory that the presence of virulent organisms in the body can and do produce "more or less" harmful results is one, based on good scientific understanding, and am quite willing to accept so much of it at this time. I believe that such foci of infection when actually proven to be present should be thoroughly removed, either by therapeutic or surgical methods. I also believe that the ruthless extraction of teeth, the unpardonable lack of ability to correctly diagnose the exact nature of the diseased areas, as to their true infective nature, the rash promises of beneficial results after operative interference, are unscientific and have no place with the thinking mind of a true scientific practitioner of medicine or of dentistry.

I cannot help but again emphasize the need of much study and work for the dental practitioner, and more kindly consideration at the hands of our medical confreres of those who are practicing dentistry. No doubt much of the lack of harmony and good will of one profession to the other was at one time justifiable for the reason that dentists did not pay enough attention to scientific training, and for that reason could not well be expected to be able to be of great assistance to the trained scientific mind of many of the medical profession, but that is a matter which is rapidly changing and dentists as a rule are becoming more enlightened on scientific matters so that they are more able to approach the consideration of the subject of infection and immunology with a broader knowledge of the underlying principles governing those subjects as well as medical subjects in general. There are many men in the dental profession who today have well trained medical minds and are capable, willing, and anxious to enter into closer relationship with their medical confreres than they hitherto have had the opportunity of doing. A patient suffering from an oral focus of infection and other bodily lesions at the same time is entitled to the joint working results of his physician and dentist together, and I hope therefore that a closer and friendlier relationship between the two professions will result for the better protection of both, realizing fully that the lack of scientific medical training must and will be overcome by my dental friends through hard work on their part and by widening the scope of study for the new entrants into the ranks of the profession, and that is now being done through the lengthening of their curriculum and the taking up of more medical work.

I am afraid in my enthusiasm I have slightly diverted from my subject but I feel that the remarks may do some good and therefore beg your indulgence. Let us accept for the present the theory, then, that infectious organisms harbored in such pathologic conditions as pyorrhea pockets and blind abscesses are harmful to a certain degree and should not be tolerated in the oral cavity. By accepting that much of our prevailing ideas on the subject, we shall at least be working on the safer side. To better appreciate the possibility of the infectious nature of these seats of disease let us consider the two classes referred to separately.

Pyorrhea is a chronic process of inflammation affecting the peridental membrane surrounding a tooth or number of teeth, the gingival margins and the production of pockets harboring bacteria of various kinds, not any *particular* organism which we might hold responsible for the disease in question but the same class of organism found in all mouths from twenty minutes after childbirth throughout life, regardless of whether the oral cavity has been hygienically cared for or not. The question whether pyorrhea is brought about through systemic conditions, such as derangements of metabolic processes, alimentary disturbances, glandular disturbances, and many other disturbances of bodily functions, or whether these bodily derangements are the results of the presence of pyorrhea is a subject which has been under discussion before the dental profession for a very long period. It would seem that the prevailing opinion on the subject, particularly by men of a scientific turn of mind has sided itself with that party who have understood that these bodily disturbances, however slight, are the ones causing a disturbance in the end lymph and blood vessel activities in the peridental membrane, and that they are the primary causes of pyorrhea. I am of the opinion that these theories are the correct standpoint from which to look upon most cases of pyorrhea infection. The resultant invasion of bacterial flora into the pyorrhea pockets makes the cure difficult and undoubtedly mitigates against a resumption of proper equilibrium in those bodily structures which were the primary cause of the trouble. I also believe that these organisms may at times become sufficiently virulent and when absorbed into the system may cause otherwise weakened structures to be laid open to the more rapid progress of the deleterious influence of infections already present.

The accepted theory that the effects of pyorrhea are detrimental to such a degree that they will cause a specific disease to occur in otherwise totally normal structures I cannot accept without modification. I believe that where some organic derangement, however slight, has been the original cause of the pyorrhea that condition may become notably aggravated by the additional strain of overcoming the new bacterial invasion, and that the one can hardly be expected to be cured without the other. I believe that the organisms contained in pyorrhea pockets are of sufficient virulence to cause a general low grade infection, one laying other structures open to disease and aggravating diseased conditions already present, but it has not been proven that they are responsible for any particular disease, arising in otherwise perfectly normal parts of the human economy.

There are undoubtedly other causes than systemic ones which produce certain varieties of pyorrhea. Local causes such as malocclusion, illfitting crowns, traumatic disturbances, etc., all are apt to gradually produce a pyorrhea condition such as was termed by Dr. M. L. Rhein, of New York City, "Pyorrhea simplex" in contradistinction to that caused by constitutional disturbances "Pyorrhea complex."

As I stated before, I do not wish in any way to minimize the possibility of the harmful influence of the bacterial flora in pyorrhea pockets and am an enthusiastic practitioner in the effort to remedy pyorrhea and its infectious possibilities, but I do believe that the harmful results have been greatly overestimated and the public been aroused to a state of anxiety entirely unnecessary, and I fear in many cases been made the subject of greedy malpractice by some unscrupulous men. Honest scientific help is what these unfortunates need and I am sure that is what they will receive from practically the entire profession. Pus laden with bacteria is constantly swallowed by these sufferers, and is constantly bathing the mucous surfaces of the oral cavity and pharynx and, therefore, is quite likely to be a real seat of infectious focus. However, that has not been proven, nor has it been proven that virulency of the organisms contained in the pyorrhea pockets is in any manner greater or different from the organisms that existed in the same mouths before the appearance of symptoms of pyorrhea, but, again to be on the safe side, let us assume that they may be harmful and let that quicken us to the task of thoroughly removing all signs of the pyorrhea infection, but let us be cautious about definite statements as to the harmful bodily influences until such times as we may be better acquainted with the true facts.

Allow me to draw your attention at this point to some rather interesting results in some laboratory experiments which we recently made; the findings were so striking that I want to mention them here in order that possibly something may be brought out in the discussion which may result in some help to me. In the course of investigations of the oral bacterial flora in a certain number of cases, smears and cultures were made also of a number of mouths which were considered to be in a healthy state, as far as could be determined. Of course, the usual flora of bacteria were found about the necks of the teeth and in a number of mouths, as usual, the streptococcus viridens. The striking feature, however, in these examinations was that, although there was no doubt of having obtained the streptococcus viridens from the anterior part of the mouth, they were not recovered from smears made of the tonsils of the same mouth. I merely mention this here to show you how much we have yet to learn about these matters and with the fond hope that someone in the discussion of the paper may throw some light on this matter for my benefit. These uncertainties about many phases of the subject surely ought to result in our becoming cautious in our remarks to patients and to men who are well versed on these matters and to prohibit us from stating as facts matters about which we are assuredly very uncertain. In discussing matters of this nature we are always stepping on dangerous ground, as the foundation stones on which our present day knowledge is laid are none too secure.

As to blind abscesses: Here we have a possible source of infection differing in every respect from pyorrhea. A blind abscess on the root of a tooth is a cystic sack filled with purulent matter, sometimes pus, and usually with bacteria. These organisms have been determined to be practically universally of a streptococcus viridens type. One of the first enthusiastic workers in this field to determine these contents was our friend, Dr. Thos. L. Gilmer and his findings, namely, that the streptococcus viridens is the prevailing organism, has been substantiated by my own findings. How ever, the contents of these sacks were frequently found to be quite sterile. To determine granulomas, as they are frequently called or, rather, their active state of infectiousness, is by no means a simple matter, notwithstanding the fact that many physicians have condemned scores of teeth to the forceps when by X-ray examination a slight shadow was found at the root apex and was immediately diagnosed as a dangerous, incurable seat of infection. Of course, our mainstay in the diagnosis of these troubles is the X-ray, but the clinical signs as well as the history have much bearing on the subject. The proper interpretation of the X-ray is a matter requiring considerable study and experience in that particular branch of science. It is a great pity that medical men generally seem inclined to regard this reading of the pictures as a very simple matter, and unfortunately, by their doing so have caused the unnecessary loss of a good many valuable teeth. At best the X-ray picture is but a shadowgraph and is never a clear photographic expression of the conditions. Distortions due to varying density of the structures involved and differences due to angle of focus are often responsible for wrong impressions, and frequently the X-ray will permit actually infected conditions to pass unnoticed. Dr. Potts said recently that it is in these unrecognized foci of infection that the real danger lies, especially if after the X-ray has shown no appreciable harmful changes and the physician or dentist assures the patient that the X-ray shows nothing when, as a matter of fact, it does show a good deal only it has not been recognized fully by the inspecting operator. It is in this class of cases, that frequent additional cause of so-called rheumatism is found and a general neuritis may give warning of the absorption of toxins.

To determine the actual meaning of an X-ray of the tooth root and surrounding bony structure requires much more than a mere casual observance of a picture. An area of increased transparency means a loss of bone and a substitution of a less dense material, sometimes pus, and sometimes the healing process of an old infection, two very different conditions, although of great similarity in pictorial expression. An area of increased density in the picture means that the normal bone has been replaced with something more dense. If of a spongy nature it is reconstructed bone; if dense, it may be a bony scar or a secondary degenerative calcification. In the first stages of bone infection (to quote from a recent investigator) about the dental root apex, inflammatory changes do not at once appear and do not produce gross bony liquifaction. Then a negative from such a case may not show any material change, or at least the findings obtained from it may not lead to the correct diagnosis, owing to the fact that so slight decalcification has taken place that the picture does not express the abnormality with sufficient clearness. After a few days or a week a condition will result which upon reexamination will leave no doubt as to the actual condition. Only after the process has become chronic will the limiting walls of the excavated bone become well marked in the picture. The infection of an alveolar abscess as seen by the X-ray may be in various stages of development or disappearance. The abscess may be entirely encapsulated; all these matters are points to be determined and will influence the therapeutic or surgical methods of procedure to be utilized. When completely healed the cavity of a periapical abscess becomes entirely filled in with mature bone usually involving a reconstruction rather coarser than the original.

So there are various stages of abscesses about root ends and they may at times be seen when they are on the road to complete return to a healthy state, so you see that the mere notation of a shadow about a root end means very little and certainly should not lead to the immediate extraction of the teeth without careful investigation. A good deal of confusion has arisen through the adoption of the term "granuloma." A granuloma is the result of a regenerative process having taken place in a abscess cavity, the bone cavity being filled with a soft mass and one that usually still contains infectious matter. These granulomas may partially heal and still be filled with infectious matter only requiring slight irritation to again spring into full activity. The mere appearance of a shadow about a root end may mean many other things than an infection. During the course of treatment of pulpless teeth it often becomes necessary to employ the use of drugs acting as strong escharotics and the result may be a coagulation of lymphoid matter at the root end, which may appear as a darkened shadow area at the apex in a picture. Such a condition naturally would in no wise indicate a pathological condition. It requires a good deal of special skill and practice to read these X-ray pictures with any degree of intelligence. To determine whether the picture denotes an active inflammatory process or an old abscessed condition undergoing the process of repair, or one that has already healed is not such a simple matter and it is, therefore, entirely wrong to condemn to the forceps all teeth which by casual X-ray examination denote some change from the normal. It is equally wrong to make light of actual pathological conditions which may be seriously undermining the patient's general health. No doubt these active pathological conditions have considerable influence as oral foci of infection.

Now let us consider for a moment the matter of extent of damaging influence. I fear I shall have to refer again to our present-day laboratory experimental work and its palpable deficiencies, on which we nevertheless base our findings.

Thirty-two rabbits were injected with an emulsion of streptococcus viridens obtained from blind abscesses from as many patients. Nineteen of these rabbits developed arthritis and in thirteen of them the organisms were recovered upon autopsy from the kneejoints. Of these nineteen cases the patients, however, only suffered from rheumatic symptoms in four instances. In six cases no streptococci were recovered from the kneejoints of these animals and they showed no symptoms of arthritis notwithstanding the fact that four of the patients from whom the organisms were obtained from blind abscesses did have arthritis. The results in these cases certainly do not show anything conclusive with reference to the pathogenicity of the organisms contained in dental blind abscesses.

What, if anything, do these findings prove with reference to oral foci of infection in the human subject? In the first place let me state that Detweiler and Robinson as well as myself achieved identical results from animal inoculations and streptococci inoculated from the mouths of normal individuals. The effect as to pathogenic changes produced in a rabbit injected in this manner compared to a similar injection into a human subject is something we can only surmise, no such injections, of course, have ever been made in a human subject. So the results of our laboratory work in that direction are results we can only imagine to be similar in case a human was to be treated similarly. The resistive power of rabbits to the pathogenic effects of streptococci is very low and that of the human being quite high, so that rabbits may easily be attacked by such an overwhelming dose but it does not at all follow that human resistive power could be similarly broken down at all. The method of suddenly introducing directly into the circulation millions or billions of such organisms into an unsuspecting rabbit is a phenomenon which has no similar occurrence at all when we consider the intake of organisms or their toxins in a human subject through oral foci of infection.

I do not mention these matters in order to criticize our present-day laboratory methods of experimentation, I could not very well, for I use them myself, but we should never forget that these are methods which are, to say the very least, most crude and very far from what actually occurs in the patients. We, therefore, to my mind, have no right to hold them up as striking examples or surely not as any sort of scientific proof.

There is still quite another phase of laboratory experimental work, the results of which are quite commonly accepted as scientific facts and which, nevertheless, leave much room for doubt. In fact, they do not seem to gibe well with our present-day knowledge at all. I refer to the vaccine therapy. While at times it may have been doubtful if the proper offending organisms were actuallly the ones obtained and used in the treatment of some of these autointoxication cases, there still can be no doubt that quite often in the hands of properly educated men in vaccine therapy the correct organisms were undoubtedly used in the majority of their cases, and the vaccine was properly used, and I feel quite certain that in my own practice I was most careful, as far as that part of the technique is concerned, and what of the results? They should have been practically always excellent, but they were far from that. Only in few instances do we get the results wished for, and while I have seen many tables showing the beneficial results of vaccine therapy in connection with oral foci of infection I feel rather sure that just as many tables showing the results of failures could have been arranged. If on the one hand our ideas of focal infection are correct and on the other our knowledge of vaccine therapy is right, it would seem to me that the results of correct vaccine treatment should show up very much better than they do. Clinical data on the results of the removal of what were supposed to be oral foci of infection in connection with other bodily disease also fail in many instances to show the results they should. It is true many spontaneous cures were obtained, many low grade infections were healed, and thereby the disease in question was laid open to the beneficial effects of leukocytosis and other bodily defensive powers and the disease associated with these oral foci did disappear, and for that reason I say let us accept at least this much of the statements made with reference to oral faci of infection; namely, that they are harmful and that they should be removed; but do not let us be too positive in our statements and burn our bridges or argument behind us, for we may be obliged to change our mind considerably on these matters and then we must be able to argue the other way. Sufficient proof that these centers cause definite diseases without other causes, purely and alone, has not been given as yet.

In order to give patients the real benefit of present-day medical knowledge it seems to me that one of the prerequisites is a closer coworking of physician and dentist, and while such a condition has been recently more generally adopted I hope that before long it will become common practice.

I would not feel that I had done this subject full justice without saying a few words at least with reference to the bacteriological flora of the mouth and their influence on general health, at least as far as we are at this time able to say. It will, of course, not be possible in the brief time allotted me to go into the subject fully but a few words may suffice to show the complexity of the subject. I feel that I can do no better than to quote some of the paragraphs from what I consider the very best monograph ever written on the subject; namely, one recently published in the Journal of the National Dental Research Institute, particularly as the views therein coincide fully with my own finding in my laboratory work. The article is by Dr. K. F. Meyer of the George Williams Foundation for Medical Research of the University of California. In speaking of periapical infections he says Hartzell reports that he found twenty-seven dental abscesses occurring on vital teeth. The infection, according to various authorities, can result from a threefold source: First, through the pulp canal, particularly as the result of over medication and too much manipulation. Secondly, through the blood stream. In such instances the abscess may be the only, or one of several points of localization. It is assumed that extensive medication can produce a state of lowered resistance to the apical tissues which can become secondarily infected by organisms circulating in the blood stream. It is presumed that a pulpless tooth provides a focus of least resistance in its neighborhood. Beretta showed that micro-organisms were contained in these abscesses artificially produced by blood stream inoculations and that the organisms remained so localized even after the blood stream had again become sterile. Particularly in teeth with closed roots, such as in the dog, the organisms remained for a long time in the pulp and in the lymphoid tissue of the spleen and the bone marrow. Thirdly, through the gum crevice. Experiments have shown that the peridental membrane is very loosely attached and offers a splendid path for infections with organisms found on the tooth surfaces.

It is impossible to state as yet which one of these three avenues is the prevailing route, but one fact is certain, that not every pulpless tooth is abscessed and that predisposing factors probably play an important role. On the other hand, it is well to emphasize that chronic oral abscesses are common infections, and that in a certain percentage of cases they are of greatest importance in the diagnosis and treatment of secondary systemic diseases. In case they develop in the manner stated under caption 1 and 3 they can be considered primarily foci of infection; the conditions described under caption 2, however, are always secondary."

A good deal has been written pro and con regarding Rosenow's work on the selectivity of the organisms found in alveolar abscesses, but I cannot go into details regarding that work at this time. However, I want to say that his findings are in many ways as yet unsubstantiated and are opposed by many prominent investigators as Poynton, Payne, Henrici and many others. A great deal of splendid work has been done by Moody with reference to lesions produced in rabbits by these anhemolytic streptococci and he fully agrees with Henrici. These findings are very important from various viewpoints, namely, the streptococci obtained from alveolar abscesses, used in his experiments from persons who in other respects were in perfect health, showed that these organisms were capable of producing lesions identical in character with those produced by streptococci isolated from patients with systemic infections. These views as you have seen by the experiments stated above are corraborated by our own laboratory work. Of course, it has not been shown that injections of organisms from normal mouths into healthy humans would produce similar results, but it has been proven that such were obtained in rabbits injected with organisms from the mouths of humans considered in every respect as having normal healthy mouths. The reports of Henrici and Moody, forthermore, show that rabbit experiments do not foretell what is going to occur in the human subject; moreover many of Moody's patients, although in good health, were past middle age and therefore more susceptible. The dental and medical journals of the last two years, the splendid work of Thomas and the summary of Billings in the form of "The Lane Medical Lectures" bring forth evidence to show that systemic disease *may* result from dental infection, but it is absolutely erroneous to conclude that chronic alveolar abscesses and osteitis *always* present a potential menace to the health of the human body. Predisposing factors like pre- or coexisting disease, fatigue, and so forth are vastly more important than most dentists realize. One should always suspect the presence of a pre-existing disease as an underlying factor in oral sepsis, before mutilating dental operations are undertaken." And again it is proven that other foci, like those of the tonsils, are probably of greater importance for systemic infections than alveolar abscesses. The mere presence of bacteria in all these foci means nothing, but together with lack of resistance, may constitute disease. That has been my contention in previous writings and I believe fully that these oral foci of infection *may* at times be the cause of low grade general infections and *may* add to the depletion of natural resistive forces of an organism already weakened in some part or another by a pre-existing unhealthy condition to such an extent that such a condition *may* very likely spring into full prominence. But there are many other factors which undoubtedly enter into these considerations that the prevalent ideas, namely, that oral abscesses and pyorrhea are per se disease-producing foci, that we are not permitted at this time to accept such statements are universally acceptable and must use our intelligence and knowledge to properly judge of the harmful nature of these foci of individual cases. The conclusions quite recently formulated by Tean Broadhurst that "streptococcal infections are those of opportunity rather than specificity" can and should unreservedly also be applied to dental bacteriology.

From the foregoing it will be noted that the relationship of oral foci of infection to general bodily disease is still a new problem and that more definite conclusions are crystallizing fast, but that at the present writing much more research and proof is necessary before we should all follow blindly the propaganda of ruthless extraction.

DENTAL PEDIATRICS.*

BY DR. JOSEPH A. GARDNER, MEMPHIS, TENN.

Needless to say that I am very much pleased to be here with you. I am sure that nothing has happened that has pleased me as much as to learn of the kind interest manifested in the treatment of children in the good old state of Wisconsin. It has been very gratifying to learn of the progress that has been made along this line. This subject of Dental Pediatrics is more or less of a hobby of mine. I have for many years felt the need of renewed interest on the part of the dental profession relative to the care of children's teeth. I heard a story told by Dr. Logan of Chicago: He told of a city located on the top of a mountain, many casualties occurred by the falling of the inhabitants over the precipice and necessitated the maintenance of many hospitals and hospital corps, and that was the condition for a great many years. By-and-by somebody suggested that a fence be built around that precipice. I am here to discuss the practice of building that fence. Dental Pediatrics means that we are to consider the possibilities of the dental profession a little more than we have been in the habit of doing. All members of the profession of the healing art are willing at this time to admit that preventive measures should be first consideration; inasmuch as they are of greater value to humanity. But the question is how are we to employ such measures as will be effective in the prevention of diseases? Where is the weakest points in the ranks of the enemies of health? When is the most propitious time to make the attack with our army or preventive agents? Out of this realm of thought, Dental Pediatrics was given birth.

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*Read before the Wisconsin State Dental Society, July, 1917.

Gentlemen, we as a profession have been contented too long with efforts to cure and eradicate. The time has come when it is up to the dental profession to develop the most precious jewel of humane science, that of the prevention of disease, and I feel confident that from the thorough understanding, and the proper promulgation of the principles of Dental Pediatrics will come true prevention.

When we refer to prevention in dentistry, it should not mean the cure of an abscess or the removal of an abscessed tooth, with an effort to prevent systemic infection, but prevention should mean the employment of such measures as will prevent the occurrence of not only an abscess, but the attack of caries, or any other condition that would lead to focal infection in the mouth. I admit that the dental profession has a great field to cover in an effort to overcome ill effects in the permanent teeth due to the neglect of the temporary set, and we must do all in our power to take care of the situation. But how much easier it would be to employ the proper preventive measures with the temporary teeth which would make it unnecessary for a single pulp to be lost, thereby allowing the permanent teeth to be erupted in a physiological manner, avoiding irregularity in the permanent set and its bad effects, and reducing the per cent of susceptibility to caries, pyorrhea, etc., to a minimum, and eliminating the far-reaching effects of focal infection in the temporary teeth. Our public school physiologists tell us that bad temporary teeth mean deficient mentality, and if it is going to the extent of affecting the mentality it is very evident that it is time the dental profession took notice. Therefore, since Dental Pediatrics is the science that has to do with the treatment of a baby's mouth and teeth, it is in this branch of dental science that our greatest opportunity lies. However, on account of the peculiar conditions that exist in the treatment of children from the age of nine months to thirteen years, both from a professional and a business standpoint, it is best that it be handled as a specialty in the practice. From a professional standpoint it means more concentration upon one subject; from the business standpoint it is very difficult to handle the situation, due to the fact that it is difficult to charge for the specific operation and then turn round and charge also per hour. It has been customary in our district for the average dentist to discourage the child patient, and I believe that is true in all dental circles. I do not believe we are quite as keen when we are in general practice, to have a little tot of seven come in when we are very tired and it is a very hot day, and we anticipate a great deal of trouble. The public has not been educated where they recognize the dental surgeon must spend time in making friends with the child, and if you do not accomplish something they are apt to be disgruntled. They feel they have not been dealt with quite fairly. It is necessary to make a good patient out of the child and a great deal more can be accomplished than if you tied the child. I recommend that Dental Pediatrics be handled as a specialty in the practice of dentistry. Another reason: It isn't every one that has a proper inclination; they are not suited to handle a child; one of the unfortunate things about it is that the surgeon must be naturally inclined that way. Some of us are repulsive to children.

It is incumbent upon every dentist to join in the mother's educational campaign. In fact, it is necessary for the mothers to become equal partners, as it were, with the dental profession, in this great undertaking, if we are to hope for the greatest good to be accomplished. I think that is the most important thing today. I believe the mothers are the ones we are going to interest most—the mother is the one we would be most likely to reach, and she needs to be educated along these lines. The best way to accomplish that is by organization. I read a little story that brings out the benefits and effects of organization, that struck me very forcibly. There was a little fellow watching a Westerner shoot a grasshopper off a blade of grass. He said: "Let me see you pop that fly off the mule's ear." The Westerner did. "Now let me see you pop that grasshopper off that blade of grass." He did that. "Now pop that hornet's nest off that twig of a tree." "No," said the Westerner, "you see it was easy to pop that grasshopper off that blade of grass and the fly off the mule's ear, but that hornet's nest is an organization." (Laughter.) Organization is one of the greatest things we have. Therefore, it is up to the dental profession, individually and collectively to educate the mothers to the necessity of Dental Pediatrics, that they may of their own knowledge realize the importance of having the proper preventive measures employed in their babies' mouths before it is too late. You will find that the mothers will respond to the slightest suggestion that is for the best interests of their children. It is appalling to know of the ignorance that exists with the laity relative to the dangers in the neglect of the temporary teeth. I will go further and state that it is incumbent upon the dental profession to educate the physicians along these lines, for it is not an uncommon thing for a physician when asked for information by the mother, relative to the temporary teeth, to say: "It is only a temporary tooth, and of no consequence, since you are going to lose it anyway; go to your dentist and have it extracted." Therefore, it is no wonder that the average mother never consults the dentist until pain has forced the children to the dental office. They do not know that if those little temporary teeth had the proper attention they would never decay and give rise to mouth infection. They do not know that an abscess at the root of a temporary tooth will cause gastro-intestinal disturbances, pernicious anemia, kidney lesions and rheumatism—which in many cases affects the heart—and last but not least, they do not know that if these temporary teeth are given the proper attention, they will be exfoliated in a physiological manner and thereby allow the permanent teeth to erupt regularly and in a healthy mouth. They do not know that it is necessary for those teeth to have constant care and attention by the dentist at intervals and every day by the mother, beginning at the time of eruption of the first baby tooth. They should be enlightened.

Now, gentlemen, if it is true that mouth infection will cause rheumatism, and that rheumatism in children will affect the heart, then dentists have it in their province to prevent heart lesions due to mouth infection. It is a fact, gentlemen, that the physicians need a little instruction by the dentists, because they are the first to see the child. If focal infection in the mouth causes pernicious anemia, kidney lesion and systemic infections of various kinds, then we are not doing our duty if we do not prevent focal infection in the mouth. In order to carry this work to a successful issue it becomes necessary to establish extension bureaus under the auspices of dental colleges, state associations and local societies throughout the country for the purpose of educating the laity as to the importance of this work. The only way to secure an opportunity to employ preventive measures that will avoid these conditions to get the baby in the dental office at the age of nine months at the latest. And the only way to get the baby in the dental office is through the education of the mother, and the way to get an opportunity to instruct the mother is by letting the officers of the various organizations, such as the parent-teachers' association, know that you are willing to give such instruction. If there is no mothers' club in your city it is your duty to encourage such an organization. Again, if it is true that a great number of the eruptive fevers are contracted through cavities in teeth, then it is possible for us to prevent a percentage of the much dreaded scarlet fever and measles, both of which so often leave the child with one or more diseased organs. I know that most of you are familiar with the exanthematous necrosis. Can you conceive of anything more horrible than death from exanthematous necrosis? And yet it is within our power to prevent it. Will we do it? I know of nothing more difficult than to bring about a normal condition in the mouth of a child from two to three years old, when a single tooth has been allowed to abscess; and how much greater is the problem of overcoming the systemic effects from that infection? A child from two to six years of age is a great deal more susceptible to the influence of septic matter than an adult, and yet, we are informed by such men as William Hunter, Charles H. Mayo, the late Dr. John B. Murphy, Hartzel, Price and others, that a large per cent of our heretofore unaccounted for ailments are due to mouth infection. These facts have been thoroughly demonstrated by the X-Ray. I had under my observation a short time ago a man forty-five years of age who had been suffering for some time from kidney lesions, high blood pressure, indigestion and rheumatism. After many unsuccessful attempts to find his trouble, after several courses of treatment without results, his mouth was X-Rayed as a last resort. Seven abscessed teeth were discovered, and after their removal he uninterruptedly recovered from all systemic trouble.

Since the campaign for "Better Babies" has been on in Memphis, Tenn., Professor David S. Gardner, who has the Chair of Dental Pediatrics in the University of Tennessee, College of Dentistry, tells me that he has been astounded at the large number of children brought to the free clinic and to his private practice at the ages of from two to three years with from one to four abscessed teeth. This condition should not exist. And I fear the burden of the blame falls upon the shoulders of the dental profession, for, in the Doctor's report from the examination of five hundred babies ranging in age from three to eighteen months, he found the following conditions: One one-half per cent or one child in every two hundred with any sign of decay at the age of nine months. Only one per cent of irregularity in the children from the age of nine to eighteen months. This tends to prove that it is not a hereditary influence and that most of the children have had the proper diet for development and eruption of the teeth, and they are as a whole in an excellent condition when they are erupted and that caries, which leads to mouth infection, can be prevented by the proper co-operation between mothers, physicians and dentists. Gentlemen, there never was a time when the profession had such an opportunity to do great things for humanity and to bring honor and glory unto itself as it now has through the practice of Dental Pediatrics.

It is a fact that a large per cent of gastro-intestinal disturbances are due to difficult or delayed eruption of the temporary teeth. I will present the following case record, which was one of several analogous cases which came under the writer's care during the summer of 1916:

Patient A.—Age, 18 months; presented with gastro intestinal disturbance; Temp., 102; stools, 5; very offensive; no blood.

Second day: Temp., 101½; 7 stools, light green in color, very thin and offensive.

Third day: Temp., 102; 10 stools, no blood.

Fourth day: Temp., 102; 10 stools, no blood, continued unchanged until 12th day: Temp., 102½; 14 stools, bloody mucous, which continued for five days when a careful examination of mouth was made, disclosing the fact that the eruption of the four temporary molar had been delayed (due most likely to an unbalanced nutrition), and instead of having the normal eruption of two teeth, the child was undergoing the extraordinary process of the eruption of eight teeth. Nature was assisted by the lancing of the gums over the eight teeth on the 17th day at 6 P. M.; Temp., 102; 15 bloody stools. Five hours after the lancing of the gums the temperature dropped to 101½.

Eighteenth day: Temp., 100; 7 bloody stools.

Nineteenth day: Temp., 99; 3 mucous stools.

Twentieth day: Temp., 99; 2 stools; returned to regular diet.

Twenty-first day: Temp., normal; one stool.

After the lancing of the gums no drugs or medicines were administered; teeth fully erupted in three weeks.

Pernicious anemia, according to Dr. Wm. Hunter, is in some cases due to a streptococcal infection, depending primarily upon caries of the teeth, and in corroboration of this theory, I present for your consideration records of two cases of pernicious anemia, coming under the care of the writer during the fall and summer of 1916.

First Case.—Age, 3 years 2 months.

Weight at birth, 8½ pounds.

Eruption of teeth, 5 months; no trouble teething.

Age child first sat erect, 6½ months.

Age first walked and talked, 10 months walked, 12 months talked.

Feeding during first 18 months: Breast fed entirely, 12 months; breast and cereals up to 18 months, when weaned.

In February: Was treated for malnutrition for four weeks, having fever for two or three days intermittent, not going high; then for 4 or 5 months got along nicely; no fever. In August had chill every day and would get them broken and they would return every 7 to 14 days; had last one about 9 days ago. No spasms. No vomiting. Bowels regular. Kidneys, O. K. No pain. Not a bed wetter. Appetite very poor. No oedema of any kind. Rests fairly well at night; does not snore; not a mouth breather. No cough. No discharge from nose or ears.

Diseases or accidents: None.

General health: Good up to February.

Clinical picture: Poorly nourished;- color, sallow, pale yellowish hue. Conjunctive yellow, muddy; mucous membrane, pale; geographic tongue; glands, enlarged; skin, dry and rough; muscles flabby.

Examination: Weight below normal.

Head O. K.; pupils little dilated; gums around teeth swollen, some pus exuding, breath bad, tongue coated, tonsils neg., glands of neck enlarged; anthers not.

Heart irregular, excitable; no murmurs.

Lungs neg. Abdomen little distended; spleen not palp., but tenderness over spleen. Possibly some fluid in abdomen. Liver palp. but not enlarged. Reflex knee exaggerated, no babniski. No swelling of scrotum; gums inflamed; lower first molar, left side, abscessed; upper first molar, left side, abscessed.

Treatment: Fowlers' solution; oral hygiene and treat drained abscess through crown of tooth; autogenous vaccine administered.

Subsequent visits: Three days later; both abscessed teeth removed.

One week later; patient much improved, able to walk, appetite good, color better, no temp. Several badly decayed teeth were filled.

Two weeks: Patient dismissed after this visit. The patient continued in excellent condition for 4 months, when he was stricken with identical symptoms as before. On investigation two of the teeth which were filled ten weeks previously were found to be abscessed; the two teeth were removed and in one week the patient had fully recovered and has had no illness since.

While, as I have said before, it is essential for the dental profession to put forth every effort practicable to eliminate suffering and as nearly as possible, correct pathological conditions in the mouth, it appears to me that the efforts of our profession towards taking care of dental pathology and abnormalities in the mouth, from the standpoint of the healing art, and especially regarding charity cases, have been almost a complete failure. A professor in one of the colleges is credited with the statement that unless a child contracts tuberculosis before the age of four years, it is never likely to contract tuberculosis. Now that gave me this hunch: What causes the lowering of the vital resistance between the ages of birth and four years? Perchance it may have been an infected tooth. I rather think that this has sometimes happened. If an abscess will cause kidney lesions and rheumatism in an adult what will this abscess cause to a child four years old? What will it likely do? We have many children between the ages of 3 and 7 who have as many as seven abscesses in their mouths. The child, I do not believe, is immune from infection. I honestly believe that with a proper practice we can prevent more disease than the medical world can cure. I have been able to put that over with my municipal government. If I am not right, I may be up here looking for a place. How good it is to feel that you have done something worth while. How much better it is to prevent than to restore. Curative and restorative measures upon the teeth require considerable expenditure of money and time; aside from the fact that a large per cent. of cases are incurable (in the broadest sense), regardless of the amount of time or money expended. Therefore, to my mind, the greatest and most permanent good to humanity must come through the practice of Dental Pediatrics due to the fact that that branch of dentistry offers the most feasible basis for the operation and maintenance of a free dental clinic, and at the same time offers a greater degree of benefit to humanity for the reasons: First—A free dental pediatrics clinic may be operated successfully with a great deal less expense on the part of a municipal, state or national government. Second—A free dental pediatrics clinic may be operated successfully with a great deal less expenditure of time on the part of the dental profession. Third—One dentist can prevent more pain, pathology and abnormalities in one hour, beginning at the age of six months and seeing the patient at intervals of three months, than ten dentists can correct successfully in ten hours, and when a community is assured that having such attention will prevent a large per cent of the diseases so common to humanity, they will rally to the cause, and those financially able will not only support the private pediation, but will gladly give their support to a free dental pediatrics dispensary.

SYPHILIS OF THE MOUTH AND THROAT.*

BY DR. G. FRANK LYDSTON, CHICAGO, ILL.

Mr. President, Members of the Chicago Dental Society: It was with peculiar pleasure that I accepted the invitation to speak to you on the subject of the evening—a peculiar pleasure because it so happens that I was one of the pioneers in the belief that your profession is merely a branch of general medicine and surgery. I believe I had the honor of reading the first paper devoted to that view before the A. M. A. away back in the eighties. The date was forcibly brought to my mind when I heard the remarks of Dr. Black. I did not suppose it could be possible nowadays for anyone, in Washington or elsewhere, to challenge the fact that dentistry and medicine are inseparable.

For reasons too many to mention I did not prepare a set paper for the evening, hence my remarks may be more or less desultory. I thought it would be better to take up chiefly the practical points, even though I should be compelled to discuss them in a rather unsystematic way.

The subject itself is very important. I doubt if the dentists, speaking generally, realize the prevalence of syphilis in our social system. We have not yet arrived at the point at which they long ago arrived in Europe, where general syphilization is looked upon as a matter of course.

Medicine and dentistry possibly come closer together in the field of syphilitic lesions of the mouth and throat than in any other field. The wise syphilographer, whenever he advises a syphilitic, first asks whether the patient has seen his dentist recently. If he has not, the syphilographer advises him to do so and have his teeth put thoroughly in order before he begins treatment. Throughout the course of the disease also, it is essential that the dentist and syphilographer should work hand in hand, because any pathologic condition of the teeth or gums may produce a determination of lesions to the mouth through the irritation produced by the pathologic condition. Then, too, the treatment itself has a very important bearing upon the mouth and teeth and often makes essential the aid of the dentist.

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* Lecture delivered before the Chicago Dental Society, Sept. 18, 1917.

Another point that is very important to the dentist in the matter of knowledge of the syphilitic lesions of the mouth and their infectiousness, is the fact that he may either infect himself, if he be not careful and on guard, or act as the medium of infection of innocent persons. I have not seen many cases of syphilis that could be attributed to careless or unclean dentistry, but I have seen a few, and even a single case is sufficient to point the moral and adorn the tale.

The lesions of the mouth are especially dangerous: *Firstly,* because they are very infectious—some of them more infectious than the initial chancre. *Secondly,* because a lesion may appear and disappear without symptoms. *Thirdly,* because a lesion may be so concealed that it is overlooked by both physician and dentist. This is especially true of the mucous patch, which is intensely infectious.

The spirochete has been discovered time and again in the mucous patch. Possibly it can be demonstrated more readily in the lesions of the mouth and throat than in any location, except, perhaps, in cases of typic chancre—the initial lesion—on the genitals. Knowing, as we all do, the many facilities for the transmission of saliva from a patient to a healthy subject, e. g., by drinking or eating utensils, pipes, or by kissing, the importance of this subject is self-evident.

The lesions of syphilis are fundamentally the same, no matter where they may be located. The initial lesion of syphilis is almost precisely the same in its structure as are all the neoplastic lesions that occur throughout the disease. The mucous patch practically is a replica of the initial lesion and of the papule. Histologically, the bubo is the same as the mucous patch or the chancre, or at least, fundamentally so, with certain variations incidental to the anatomy of the part involved.

I have been wont to teach to my classes what I term the selective action of syphilitic infection. I will explain what I mean: It is difficult to say in any given case that the infection is a mild or a severe one. The mere presence or absence of lesions, or the multiplicity of lesions, is no criterion of the severity of the disease. Tertiary lesions—so-called—may appear in cases in which there is a history of an initial lesion with no intervening symptoms until severe brain or cord disease appears. In other cases the course of the treatment will be perfectly satisfactory and the patient will apparently recover, although during the course of the disease the patient has had very severe lesions. I was at a loss to explain this until I divided the body practically into certain areas, viz: *a,* the skin and mucous membranes; *b,* the blood vessels and lymphatics; *c,* the nervous system; *d,* the bones, and *e,* the viscera.

In some cases the explosion of the disease, so to speak, is by way of the skin and mucous membranes. The patient has a typic skin eruption, then mucous patches and falling of the hair. In another, without any of these demonstrations, the disease expends its violence upon the blood vessels and lymphatics, in another upon the viscera, and so on. There may be no early symptoms referable to the blood vessels, and no external manifestations whatever, yet serious nutritional disturbances and perhaps gummy lesions may occur later on, all due to the nutrition-disturbing action of the early infection. We shall see later that this selective action of the infection is especially important in the field which is the special subject of the evening—the syphilitic lesions of the mouth and throat. There are several factors in syphilitic infection.

Syphilis is complex—it is not at all simple. Following infection by the spirochete there are several elements to contend with. *Firstly,* the action of the spirochete in building up new growths—granulomata—simulating the lesions of chronic inflammation; *secondly,* a toxemia, the effect of which is added to that of the pressure of syphilitic neoplasm in various locations; *thirdly,* the patient's individual constitution; *fourthly,* the effect of remedies—notably of mercury and potassium iodid, and *lastly,* added to all these factors, any bad habits characteristic of the patients—for example, liquor and tobacco.

Now, liquor and tobacco, and particularly tobacco, are of the greatest importance in the consideration of the lesions of the mucous membrane of the mouth and throat. The syphilitic who smokes or chews has to contend with the detrimental effect of the irritation of the tobacco upon the mucous membrane of the mouth and throat. He rarely goes through the course of syphilis, whether under good treatment or not, without lesions of a greater or less degree of severity of the mouth and throat.

The patient who avoids tobacco has more than an even chance of escaping these particular lesions. The mucous lesions are getting fewer and fewer and diminishing in importance in direct proportion as we are learning to use mercurials in the proper manner and not to administer them to excess. The substitution of salvarsan for mercury has, of course, had much to do with the diminution of the severity of the lesions of the mouth and throat. I do not mean to imply that salvarsan is an efficient substitute for mercury, for it is not, but those individuals who have been wont to use mercury unintelligently have substituted salvarsan for it. In this way the mouth and throat have escaped lesions which previously have been determined by the irritating effects of the mercury itself,—which is something that we always have to deal with in mercurial treatment, and something against which we always have to be on guard, no matter how intelligently we may employ mercury. If, however, the patient is properly treated and abstains from tobacco, mouth and throat lesions are rare.

I wish to impress upon you particularly the importance of the "determining" factor of pathologic conditions of the mouth and teeth, tobacco, food substances, heat and cold and, incidentally, liquor, in the production of lesions in that portion of the anatomy that most nearly concerns you and your practice. In my humble opinion, alcohol is a most decided determining factor in syphilis. It is not so considered by most physicians. They recognize that patients do not do well if they indulge in alcohol, but they do not appear to have a lucid understanding of the reason therefor. The irritation of the liver and kidney produced by alcohol often furnishes the determining factor in the development of paresis, locomotor ataxia, syphilis of the kidney, syphilis of the liver, and so on.

Now regarding the toxemia of syphilis. Those who are versed in syphilogy know that there are certain lesions in syphilis which are not attended by a heaping up of cells, i. e., by a neoplastic infiltration of the tissues. This syphilitic neoplasm is the characteristic histologic feature of the majority of the lesions of syphilis. For example, the primary chancre or initial lesion is composed of heaped up cells, leucocytes and derivatives of the leucocyte, and connective tissue cells and so on, which explains why the initial lesion is hard and, in the majority of cases, dry. In the mucous patch there is first a pearly infiltration which on examination proves to be mainly a heaping up of these same syphilized cells. In the old days I used to teach that this was the result of infection by syphilized cells from the original source of infection. Since the spirochete was discovered I have been compelled to modify my teaching by the statement that the cell is syphilized by the spirochete. That is the only modification of my former views of the pathology of syphilis.

We now will consider the effects of the toxemia *per se.* The toxemia of the early stages of syphilis produces some very characteristic lesions. For example, the patient loses his hair; it has a peculiar "plucked out" appearance. If you have ever seen this particular *alopecia areata,* you simply will smile when the victim tells you that he has lost his hair from a fever of some kind. The alopecia sometimes is so extensive that all the hair is lost—I have seen patients who have lost every hair on their bodies, even the eyebrows and eyelashes. This is a purely nutritional disturbance. If it were due to the heaping up of syphilitic cells, the patient would be covered from head to foot with papules, while in the alopecia areata there would be a papule at every point where the hair has fallen. This not being the case, and knowing the underlying cause, we must look for something else to explain the loss of hair, and this is important, not only as to the loss of hair but as bearing upon the nutritive disturbances of structures other than the scalp. We know that in typhoid and other fevers there occur disturbances of nutrition and falling of the hair. Experiments have been performed upon cats and dogs, making sections of the sympathetic nerve in the neck and producing experimentally *alopecia areata* precisely like that of syphilis, showing distinctly that disturbance of the sympathetic nerve supply has much to do with the alopecia of syphilis.

Now we believe that there are "trophic" nerves, which preside over nutrition. Whether these nerves form a distinct and separate entity—a trophic system or whether the so-called trophic nerves are not really a system we do not know, but without much question there is a distinct nutritive function of the sympathetic system and its ganglia of the sympathetic. About twenty-five years ago I called attention to certain lesions of the mouth, particularly of the palate and alveolar processes of the jaws, which, it seemed to me, distinctly point to a trophic effect of syphilis.

Ordinary lesions of the bones—upon the tibia, for example—are very painful. A node the size of a grain of wheat upon the tibia often will cause intense suffering at night, and if you touch or even point your finger at this tibia the patient will jump. Here there is a heaping up of syphilized cells between the unyielding tissue of the bone and a comparatively unyielding tissue, the periosteum, above it. The lesions of syphilis are not painful *per se*. Neither the infection of syphilis nor its toxin produce pain unless complicated by secondary infection of some sort, or where the cells are heaped up within the confines of unyielding or relatively unyielding tissue. This is proven by the fact that relieving tension by a touch of the knife will cause the pain of a node to disappear. The patient may or may not have had treatment, still these painful lesions may develop. The jaws, and speaking more specifically, the hard palate are not particularly insensitive. If you inject simple water beneath the hard tissues of the palate, you will observe that this structure is extremely sensitive to pressure. If a syphilitic node should form upon the hard palate—between the soft parts and the underlying bone—you can easily understand that the patient would suffer with severe pain. The destructive lesions of these parts, however, are not painful.

I will cite a typic case to illustrate what I mean. A patient states that he has a little ulcer or rough spot in his mouth. You ask him: "Is it tender?" "No." "Is it painful?" "No." "How did you happen to notice it?" "A little food got stuck in the roof of my mouth and I touched my tongue to it and felt a rough place and I want to see what it is." Pass a probe up through that sinus and you will find that a greater or less portion of the palatal process is dead. The palatal processes on both sides may be completely necrosed. How are you going to explain this on the basis of an exudate that has cut off the nutrition of the bone? That is the ordinary way in which death of bone occurs, but, if there had been pressure enough from a syphilitic neoplasm to cause such extensive death of bone the patient certainly would have had agonizing pain, but, on the contrary, he knew nothing about it until nature endeavored to eliminate the dead bone and a sinus had formed. When we tell the patient that the bone must be removed, we should warn him that, after the dead bone has been removed, his speech will be impaired.

Now with reference to the view that the death of bone might have been produced a by pressure innutrition. Remember that the maxillae are very well supplied with blood and it would require a very large cell infiltration or node to produce such extensive necrosis. The same is true of the vomer and of the nasal bones. A patient may have what he believes to be a catarrh, with a very offensive secretion, but the expert surgeon finds that the nasal bones—perhaps both the *ossae nasi* and vomer—are dead, and still this patient has had no pain. A saddle nose results. You can understand how the fallacious theory arose that in such cases the bones of the nose are destroyed by catarrh. The catarrhal discharge is the result of the necrosis with, perhaps, complete destruction of the bones of the nose, and simply is evidence of nature's effort to eliminate a foreign body. The intermaxillary bones particularly, and the alveolar processes are likely to be involved in a similar necrosis. Most of the lesions of these parts that produce caries or necrosis are very painful, but here we have a condition which may painlessly destroy the alveolus.

Reverting to perversion of nutrition in syphilis, it has seemed to me that the syphilitic toxemia has a special predilection for the head, and especially for those parts supplied by the fifth nerve. Not because the fifth nerve *per se* has anything to do with it, but because the sympathetic nerve fibers supplying the same areas have a great deal to do with it. I stated many years since—and it has not been successfully refuted so far—that the alopecia of syphilis was produced by the action of syphilitic toxins upon the sympathetic. This is important in explaining the peculiar characteristics of certain lesions of the mouth, particularly those affecting the osseous tissues of the maxillae. We already have seen that lesions on the hard palate are not always what they seem. That an apparently trifling little ulcer of the palate or of the alveoli may be associated with a very extensive necrosis, is in my opinion explicable only by perversion of nutrition of the bone produced by the syphilitic toxin. Until you see one of these cases you will not quite appreciate the force of my remarks. The general surgeon who is not familiar with this class of cases does not appreciate the true condition until he has seen a case.

Now just a word as to the primary sore initial lesion of syphilis—chancre—occurring in the mouth or throat. These lesions are not always venereal in origin. Syphilis is, so to speak, the least venereal of all the venereal diseases. As already seen, it is very frequently contracted in innocent ways—by kissing, the contact of a pipe or cigar that someone with a mucous patch has held in the mouth, infected towels, and infected drinking cups, are often the medium of infection. It is well for you to know something of the characteristics of the primary lesion of syphilis in the mouth. If the surgeon is not careful he may overlook both the mucous patch and the primary lesion. The patient with a concealed slight mucous patch and no sign of infection of the mouth or throat is very dangerous. If you note upon the mucous membrane of the mouth or throat or lips or tongue—a small indurated ulcer and after a week or two find an induration of the glands beneath the jaw, then you know that you probably have to deal with a primary syphilitic infection. An ulcer of the mouth which is unaccompanied by enlarged glands, and which is proved to be a syphilitic lesion, is presumptive evidence that the infection did not enter by way of the mouth, tongue, throat or lips.

Typic syphilis is a very systematic disease, the most systematic of any infectious disease with which I have any acquaintance. Within two or three weeks after the primary sore develops, a bubo—or what we term primary adenopathy—appears in the nearest group of lymphatic glands. This adenopathy is very characteristic. The glands are not tender unless complicated by mixed infection. The swelling is circumscribed and usually movable. The symptom-complex of primary syphilis is not complete until this primary adenopathy appears. The fixed principle in typic cases is this: that within a short time after the appearance of the initial lesion of syphilis, no matter where it may be, there is an enlargement of the glands into which the lymphatics of the tissues of the areas primarily affected drain. In chancre of the mouth, the enlarged glands beneath the jaw are an exact reproduction of the initial lesion in the mouth. In a primary genital lesion the bubo is an exact reproduction of the lesion there.

The time and place of the appearance of bubo relative to the time and place of the appearance of the chancre, sometimes are of medico-legal importance. I once was consulted by a married woman and her husband, accompanied by the mother-in-law, regarding a syphilitic infection of both husband and wife. The mother-in-law and the wife were going to have a divorce right away and the question arose as to the chronology of the infection. The woman had a bubo in the groin and a sore in the mouth. She claimed to have been infected by her husband through kissing. He had returned home after six months' absence, two weeks before I saw the case. Knowing that the sore in the mouth could not possibly be a primary lesion —the bubo being present in the groin—but a secondary lesion which could not have appeared within eight or ten weeks from the time of the primary lesion convinced me that the husband was not the guilty party. As the husband admitted that he had contracted his own infection extra-maritally, and really thought that he had infected his wife, I concluded not to disabuse his mind. I suggested to the lady that, while I knew all about such cases, some physician in a smaller town might go on the stand and confuse matters. She evidently grasped the idea, for the husband came in the next day and wanted to know what I had said to his wife and her mother, as everything was "all fixed up."

As dentists there is no reason why you should not know at least some of these things and thus prevent dangerous deception by your patients. The ease with which syphilis can be contracted if there is an abrasion upon the skin or mucous membrane is very remarkable. To get away from the mouth a little: A medical man consulted me regarding his wife, who had some peculiar lesions on the lower limbs. I found that she had a number of tubercular syphilides, which had been pronounced something else, much more innocent, by another physician. The husband had an inflamed and indurated lower eyelid, which proved to be a chancre. He had been attending a case of syphilis, and was not as careful as he should have been in the toilet of his hands. Innocently enough, he had infected his wife. Similar cases occur so frequently that it is just to say that syphilis is the least venereal of all venereal diseases.

There is one very characteristic picture that sometimes is seen in the mouth. You are all familiar with ordinary ring-worm of the skin. When you see in the mouth a lesion of a similarly circinate form you know that, no matter what the microscope may show, no matter what the test of the blood may show, the lesion is almost certainly syphilitic. I will relate a case of this kind. A physician had inoculated his finger some time prior to consulting me. An ulcer developed which he did not suspect was syphilis. Later on he developed a sore throat and he consulted various physicians, one of whom finally referred him to me. It was a characteristic circinate syphilitic lesion of the throat and uvula and I so told him. "But," he said, "I have had three negative Wassermann tests in the last three months and the secretions have been examined for the spirochete without result, time and again." "But," I replied, "Just the same it is syphilitic." I asked one of my expert friends to examine the case. He promptly diagnosed syphilis. "But," I said, "the patient has had three negative Wassermann tests." "I don't care if he has had a thousand," replied my friend. The patient went to New York and consulted a celebrated authority, who pronounced the condition "Vincent's angina." The patient returned to me after a while and said: "I guess you would better treat me—I have had four positive Wassermann tests in four months." I treated him for a while and then he went away for a trip around the world. He had frequent Wassermann tests, and they were negative for two years, during which period he stopped treatment. I met him about this time and asked him how he was getting on with his Vincent's angina. He replied that he had had three positive Wassermanns within three months.

Now, inasmuch as the Wassermann test is absolutely unavailable until secondary blood infection has occurred, and you may have a primary lesion of the mouth to deal with, it is just as well to remember that syphilis really is a local disease at the beginning. Clinically, we must regard it as a constitutional disease, because we cannot prevent it from becoming so—treatment with salvarsan notwithstanding. Although we should recognize the disease as constitutional from the start, there are no clinical manifestations until the infection has entered the blood and general system of lymphatics. It therefore must have become constitutional before we can get a positive Wassermann test.

There is another angle to the Wassermann test. I attended a medical meeting one night at which a gentlemen proceeded to damn the test up and down. He said that in such-and-such a hospital they had a case of brain tumor which case showed three positive Wassermanns, and that when he opened the skull he found a glioma, which is not a syphilitic lesion. In another case—of ulcer of the tongue—he said that there were four positive Wassermanns, but that when he had removed the tongue the microscope showed carcinoma. In discussing his remarks I asked the gentleman upon what peculiar hypothesis he based his belief that a carcinoma of the tongue or a glioma of the brain was a protection against syphilis. If you get the point of these two cases you will see what a lot of confusion has entered into the differential diagnosis of syphilis through a cocksure reliance upon the Wassermann.

I am not sure that, taken by and large, the discovery of the Wassermann test has not done more harm than good, because only a small proportion of cases of syphilis fall under the care of the expert. They fall into the hands of the general practitioner, or at least, of physicians who are not very profoundly versed in syphilology. With too great reliance upon the Wassermann very serious trouble is likely to arise. A patient may have a negative reaction for some years and then suddenly show a positive. In the interim the majority of practitioners will say, "You are cured of your syphilis," yet he is by no means cured. The Wassermann test, after all, is a test which merely shows whether or not at a given time there is a blood symptom. A negative Wassermann does not prove that the patient has not syphilis.

I would not feel that I had done my subject justice if I did not dwell upon the relation of syphilis to malignant disease appearing in the mouth and throat. It is only of recent years—and possibly to some extent through my own humble efforts—that much stress has been laid upon the relation of syphilis of the mouth and throat to carcinoma. Syphilis of the throat is not directly transformed into malignant disease; it is replaced by it. The lowered resistance incidental to syphilis—irritation of the mouth and throat by tobacco, liquor and food, particularly by tobacco and by treatment for syphilis, are conditions which are very likely to determine the chronicity of any lesion occurring in the mouth during the course of treatment.

Dental lesions frequently are determining factors. We will suppose that the patient has a jagged tooth and the physician has not sent him to a dentist, or he has not gone to a dentist: The constant irritation in connection with the other factors mentioned may develop a carcinomatous neoplasm. The original site of the cancer may have been the site of a mucous patch or a mucous ulcer.

Injudicious treatment of syphilis by mercury has much to do with the development of cancer of the mouth. When you examine the mouth and tongue and throat of a syphilitic and see pearly patches of infiltration, perhaps with little fissures in them, you may safely tell that patient that he has the beginning of malignant disease—no matter what the microscope shows.

The microscope is a valuable instrument—we all recognize that—but see how it can deceive us! Here is a typic case: A patient whom I had treated for indubitable syphilis, a heavy drinker and smoker, had leukoplakia and fissures of the tongue and I warned him what might happen. He disappeared some months later and about a year afterward he reported that he had a recrudescence of the lesions of the tongue, and consulted a physician who had cauterized them. Inspection showed clearly what to my mind was a carcinoma of the tongue upon a syphilitic foundation. I said to him: "If you take my advice you will have an operation. We will examine the tissue with the microscope, but I warn you that the microscope may show no evidence of malignancy. That, however, will not change my view at all." As the neighboring lymphatic glands were not enlarged I treated him with salvarsan for six weeks and then refused to treat him any longer unless he would let me operate. He consented and I removed one-half of the tongue—antero-posteriorly—and the lymphatic and salivary glands of the corresponding side. He recoversed and has been perfectly well for five years. As to the diagnosis: When the specimen was examined microscopically, we found away down beneath the raphe, where there was no possible chance to find them without a radical operation, the characteristic pearls of carcinoma.

In such lesions of the tongue, particularly where there is a history of syphilis, the physician too often sticks to the syphilitic theory until such time as the microscope proves that it is cancer. Then, when everybody knows it is cancer, is not very promising surgery so far as complete recovery is concerned.

Another case which I saw in consultation was a supposedly syphilitic lesion of the tongue which did not yield to treatment. I immediately pronounced it carcinoma of the tongue and was at once informed that there had been some fifteen microscopic examinations of sections and that they all were negative. I explained that that proved nothing and that a hemorrhage from the lingual artery might occur at any moment. Within three days he had a severe hemorrhage and an emergency operation was performed. The removed epicemen showed abundant evidence of carcinoma.

I want to impress upon you the fact that every case of indurated plaques in the mouth should be radically treated on the basis

Now, in reference to the tertiary syphilitic lesions which frequently occur in mouth and throat. I taught for many years that much of the so-called tertiary syphilis really was not syphilis at all. What I said to you in explanation of the osseous lesions of the jaws and nose also is the explanation for many of the so-called tertiary lesions. I admit that the spirochete is found and that the Wassermann is positive in many cases of tertiary syphilis, but I am inclined to think that in a large proportion of cases, the spirochetes, and the toxemia produced by them, did their worst in the secondary or active stage of the disease, so affecting the lymphatics and blood vessels that finally a disturbance of nutrition occurred, certain lesions of the brain or cord or vessels of the brain developing as a consequence in later life.

that, potentially at least, they are carcinomatous, no matter what the microscope shows.

SYSTEM AS APPLIED TO THE DENTAL OFFICE.

BY HENRY L. WHIPPLE, D.D.S., QUINCY, ILL.

System in the office in carrying out the regular routine of work must necessarily increase the efficiency of the operator and to this end, for the benefit of those who may care to work out a "System" for their individual practice, this article is written.

This paper will first take up the several systematic methods that should be employed in the conduct of business in a well-regulated office, later going into the "Cost Sheet System" to enable us to determine what it is costing us to do the business of the office, not for the purpose of raising our fees alone but to insure that our fees are large enough to permit us to carry on the business to the end of the year "Without actual loss."

To the younger men I would say that if this matter of "System" had been taught and written about years ago, there would be fewer men at this time wondering at the end of each year why there should not be a better balance or even any balance at all in their favor after figuring up the business of the year and if I may be of service to the younger members of the profession in causing them to think seriously on the following facts, I shall be greatly pleased.

First, I will dwell upon the decided advantages in the use of

Consolidated Cost Sheet

For business for year

HENRY L. WHIPPLE
ILLINOIS STATE BANK BUILDING

			ESTIMATE FOR THE YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL TO COMPARE WITH ESTIMATE
	General Overhead Expense	Rent														
		Taxes														
		Insurance														
		Light and Power														
		Telephone														
		Journals														
		Societies														
		Charity														
		Laundry														
		Upkeep														
		Miscellaneous														
Principal Cost of Doing Business	Material Expense	Operative														
		Laboratory														
		Desk														
	Productive Expense	Personal Productive														
		Non-Productive														
		Assistants														
		Losses														
Education Equipment		Interest														
		Interest														
		Depreciation														

Chart No. 1

MONTHLY COST SHEET

HENRY L. WHIPPLE

DATE	RENT	TAXES	INSURANCE	LIGHT AND POWER	TELEPHONE	JOURNALS	SOCIETIES	CHARITY	LAUNDRY	UP KEEP	MISCELLANEOUS	OPERATIVE	LABORATORY	DESK	PERSONAL PROD'V	NON-PRODUCTIVE	ASSISTANTS	LOSSES	INT'S EDUCT'N	INT'S EQUIPMENT	DEPRECIATION

Chart No. 2

two separate operating rooms, completely equipped with duplicate instruments even to the minutest article, showing the advantage to be the conservation of the operator's time.

The first patient is placed in the room selected for the first operation and at the proper time, the next patient having arrived to keep the appointment, is immediately taken to the retiring room, then to the second operating room, the napkin adjusted, ready for the operator to proceed with the work in hand the moment he steps in.

When the first operation is finished and the last instrument is put down, the assistant is informed as to the length of time required for the next appointment and after bidding the patient adieu, the operator at once steps into the next room and after performing the required ablution, proceeds as in the first case. The assistant attends to all things necessary to dismissing the patient, rinsing the mouth, removing the napkin, sends her to the retiring room where she may arrange her toilet prior to leaving, and there is now sufficient time for proper sterilization of all instruments used in the operation and replacing in the individually proper place.

This method is carried on throughout the entire day, constantly alternating from one room to the other and it is easy to be seen that fifteen minutes are saved for every patient during each day which will amount to hours. The assistant not only assumes the work as above described, but carries on all the conversation the average patient seems to think is essential to departing.

I have followed this method now for two years and have positively proven to my own satisfaction that I have at my command, *two additional producing hours* each day and I am enabled to leave the office one hour earlier than formerly, and in the first year, the additional cost of the second equipment will be easily covered by the earning power of those additional two hours.

It seems hardly necessary to speak of the cleanly habits in this day and age, but I will simply mention the most important, other than the above mentioned sterilization of instruments. The hands should be washed when the patient is present, also fresh drinking cups should be placed at this time. The assistant as well as the operator should be dressed in white from head to foot, for it is my opinion that our street clothes should not come in contact with the patient during any operation and you may rest assured that the patient delights in talking about it.

EXAMINATION CHART.

At the time of examination, a chart is made of the work needed in each mouth, an appointment is made for the work and the chart is filed away in a card filing cabinet with alphabetical index.

Each morning the assistant looks over the appointment book and going to this filing cabinet, selects the chart for each patient for that day and as the patients come to keep their appointment and are placed in the chair, this chart together with a charge slip, is placed on the bracket for the guidance of the operator, making a further examination unnecessary, thereby saving time.

As each sitting is finished, the chart is checked on the work done at that sitting, the proper charge is made on the charge slip, with accurate description of the work, for the information of the assistant and as the operator passes to the other room, he carries these slips with him placing them on the desk in the assistant's, or business office, as he passes through.

The operator will find that by making the proper notation of the charge at this time for each operation, the danger of forgetting one or more charge each day is eliminated and especially will it be true where emergency work may be done. These forgotten charges added up through the year would amount to a surprisingly large sum.

This method is employed throughout the day and when work of the day is over, the assistant transfers all of the operations to the day book and immediately posts to the proper Ledger Card, keeping an accurate check on the Ledger Chart the description of the work for each particular patient, that there may be a permanent record for years of all work done.

RECALL FOR EXAMINATION.

When the patient has returned for the last time and the work called for on the examination chart is finished, the assistant is, by a written word in the "Information Column" on the charge slip, informed that this patient is to be recalled for examination in three months from that date and on the reverse side of the examination card, in a column for that purpose, she will write the date of recall.

This card is then filed away in an index file of calendar dates, either the first, tenth or twentieth of the proper month.

Should the card, for instance, be filed in the September tenth lot, when that date comes, each card filed in that date is taken out and the patient called up, or a card for that purpose mailed, notifying them that they are due for examination and they are asked for a convenient time for appointment.

When the appointment is made, the call date on the back of the card is checked and the card is transfered to the index file in the alphabetical list and as has been mentioned above, this card is then taken out when the day of appointment has arrived.

The patient is taught to be enthused over the idea of recall and that preventive dentistry, and the conservation of pain, time and amount of work necessary is also conservation of expense.

When the patient first comes to me I give her full information as to my method and the preventive reasons for the same and I show her that if she is willing to put herself in my hands, she must at all times be willing to respond to my call as it is done for her good alone.

Careful instruction is given to each patient relative to the method I deem best in the proper care of the mouth at home, and suggestions are made that their earnest co-operation will be the means of minimizing the work and I impress upon them the importance of their agreeing to follow out implicitly all of my instructions and should they at any time feel that I am requiring too much of them, I assure them I will gladly remove them from my list of patients for recall. This works wonders in causing enthusiasm over the plan.

In all operations, no matter how minor, my slogan is, Do every thing conscientiously, carefully and well and do it immediately, in other words, *deliver the goods.*

SYSTEM IN PRODUCING THE COST SHEET.

Much has been said and written about the cost of "Doing Business" and I feel that this paper would not be complete without touching upon this part of the subject and while those who have heard me lecture before the different local societies on the subject of "System" will appreciate the difficulty of portraying the method of working out a cost sheet in a paper of this kind, I will endeavor to show by charts as well as possible what should be done and the individual case may be worked out by the reader with this guidance.

The "Principal cost of doing business" is divided into three groups, first, "General overhead expense," subdivided into items of expense as follows: Rent, taxes, insurance, light and power, telephone, journals, societies, charity, laundry, upkeep and miscellaneous. Second group, "Material expense," subdivided as follows: Operative, laboratory and desk. Third group, "Productive expense," subdivided as follows: Personal-productive, non-productive, assistance, losses.

Separate items of Interest on Education, Interest on Equipment and Depreciation on Equipment may rightfully be charged up against the annual cost of doing business.

In the chart No. 1 below, you will see the first column is an "Estimate for the year." Should the reader desire to work out a system for his office, he will estimate the cost of each department and total it up, and at the end of the year in the column "Total to compare with the estimate" he will find how nearly correct his estimate may be. Each succeeding year comparisons may be made until his fees shall have reached a point sufficient to cover the actual "Cost of doing business" and if for no other reason a cost sheet should be used.

Chart No. 2 is the Monthly Cost Sheet upon which the expense of each department may be kept daily, being totaled at the end of the month and transferred to the Consolidated Cost Sheet (Chart No. 1).

As I have said above, it is impossible to clearly define my methods in this paper but it is sufficient to enable those who desire to work out a system in getting a ground-work, after which the matter of fees must be taken up by each individual.

He must determine how many days each year he spends in actual work after deducting all holidays, vacations, etc., next how many hours (actual producing hours) he will have each day, then he will determine the number of "Producing hours for the entire year."

Having totaled up the entire cost in the column, "Estimate for the Year" on Chart No. 1, and dividing this by the number of "Producing hours" he will find that his rate of fees must be "So.much per hour" and he must receive this hourly revenue for the estimated number of working hours for the entire year equal to the total "Cost of Doing Business" in the estimate or he will not be able to pay his expenses to say nothing of putting aside that coveted amount for "the rainy day."

Apropos, in this war time tax on personal income, is just such a cost sheet, for without the items of expense in doing business, how is it possible to say what you truthfully must say is your "Income."

I do not feel that I have overstepped the bounds of Professional Ethics in any way in taking this view of the matter of cost in this article, but feel that we should all look the subject squarely in the face, and in teaching the young student the "art" of doing business we are deficient as educators unless he shall also have been taught how to do his business without loss to himself.

In closing I wish to say, however, to the younger reader, that he must always bear in mind this most necessary and important point, while his fees should be large enough to cover the cost, yet he must try earnestly to *give value in service* even to the minutest detail.

WISCONSIN STATE DENTAL SOCIETY.

FORTY-SEVENTH ANNUAL MEETING, HELD IN JANESVILLE, JULY 10-12, 1917.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

[This address was published in the October number of the DENTAL REVIEW.]

DR. O. G. KRAUSE:

I enjoyed the address of the President very much. I am happy to note the progressive attitude of Dr. Meyer, an attitude that he has maintained throughout his career. He is one of the truly progressive men of our society, and it is greatly to the credit of the society to have such a man a member of it.

He has mentioned the component societies. The component idea is the correct idea and we can attribute our success to that theory.

He made reference to our late friend, Dr. Holbrook, and suggested that a resolution of condolence be prepared. I would move that a suitable memorial, a tablet or memorial be prepared and presented to his family. All who knew Dr. Holbrook knew that he was the very highest type of man we had in our profession, as did all who knew Dr. Batchelor. I approve also of the donation for the Dr. Black Memorial Fund. The extension work the president mentioned is worthy of attention, although in the present condition of our treasury I question if a very large amount of work can be carried on as yet.

Another thing: the Journal should be published a little oftener, this is not a criticism of our editor, for I happen to know what he has to contend with, I happen to know what Dr. Eisen went through when he was editor, and happen to know what Dr. Hopkinson is up against when he calls for assistance, and believe the suggestion of having associate editors a good one. Just as Dr. C. N. Johnson says, I believe the Journal should be published three or four times a year. We have to keep the membership alive and keep them informed as to what is going on.

He also made reference to our fiftieth anniversary. We ought to make arrangements at this time, at this convention, immediately, for the celebration of this event. I believe it should be held at Milwaukee, in the Auditorium, and we should make arrangements now to secure the Auditorium, because it is in great demand, and if it is not arranged for, we may be handicapped for lack of space.

Dr. W. F. Faust:

Ladies and Gentlemen: I consider it a special honor to have been asked by the president to discuss his paper.

In regard to some of the things the president has said, they are good. I would state that it has been in my mind for some time to make the fiftieth anniversary of the society a booming success, and have been considering if it would not be a good plan to make an effort to have the National Society meet with us at this time. If this has the approval of the convention it is my intention to extend an invitation to the National Society at its meeting in New York City in October of this year, to have it meet with us for our fiftieth anniversary. I think we would have a splendid meeting.

In regard to the Research Institute, which I understand is coming up at this meeting. You can go back as far I think as 1890 or 1891, I know it was a year or so after I graduated, Dr. Miller of Berlin gave us reports on the relation of oral disease to systemic conditions, and the truth of these are just being recognized. Dr. Rhein of New York City, who appeared at a dental meeting in Milwaukee last week, made the assertion that a good many deaths are caused directly through diseases of the mouth, where the direct cause of death was the teeth. We had a case in Milwaukee within the last six weeks where the death of a physician's wife was caused by tooth trouble, so I think the Research Institute should be supported. The work has been carried on by voluntary subscriptions, and while the response has been as good as could be expected from this State, I think we should pass a resolution to add $1.00 to our yearly dues, and it should be carried without a dissenting vote.

At the last meeting I presented a resolution to change the date of our meeting. This is the time of the year our professional brothers take their vacations and they will not give up that vacation for the benefit of the Wisconsin State Dental Society. I think we would have a better attendance if we had our meeting later and not take chances with the weather as we have done the last few years.

As to the Black Memorial: I am glad the resolution has been passed by the Executive Council to contribute $100 to that fund, and so I need say nothing further about that.

As to reciprocity: we know that legislation is governed by conditions that existed in the colleges in years past. A good many colleges would graduate a man whether he knew everything about dentistry or not, but even as the laws are at the present time, I do not think they are correct. I think if a man is licensed to practice dentistry in one state, he should be permitted to practice in any state. Why should he be compelled to pass an examination in the state he wants to practice in? I have always had an idea which I think is that of a great many. I think after a student passes his college examination let him take his state examination, but I think that there ought to be a general executive board—a central board—composed of different members from different sections of the country. You can divide them into eight sections or districts and let each one of these districts appoint a man for the central board who will raise the questions which are to be asked of the different applicants so far as examinations are concerned. The examinations are to be held the same day in the different sections and then the written examinations should be presented to the central board and if the candidate passes the Board let him be permitted to practice wherever he wishes. I, myself, would not be able to pass an examination if I had to practice elsewhere, and how many of you in this audience could pass an examination? Not 95 per cent, so I consider that plan which I have been thinking of for a great many years, and which I think is a plausible one should be adopted.

As the president has stated, the only charter member remaining of this society has passed away during the past year, I think this society should pass suitable resolutions. I wish to thank the chairman who has made arrangements for this program. I also wish to extend my heartfelt sympathy to Dr. Gilbertson for his great loss, I know his position has been a most trying one in regard to making up the program, his trouble just having about begun about the time he had begun to take action for this convention.

The President: (Closing the discussion.)

I am very happy to have some of my views concurred in and others criticized. It is not well to have one-man power, or a policy of "rule or ruin." An even balance can be more surely preserved by taking the best out of all the suggestions that come along. When

I speak of reciprocity, I was not thinking of myself, for I have no intention of leaving where I am so happily located, but some times by the force of circumstances, poor health or otherwise, a dentist is forced to change his locality, and because he has forgotten some of the technicalities and cannot pass the examination of the state he is forced to locate in, he may be compelled to be the recipient of charity.

Your idea of a general board or general examination, I think, is a good one. My only purpose in bringing out the reciprocity question is to make our legislative committee get busy, and when I wrote Dr. Hardy he said there was nothing to do. We are in a pitiful condition, but I think by co-operation and taking up the matter at the proper time we can come to a very happy compromise and get suitable legislation on reciprocity. It may be many years before it can be accomplished, but the only way to get it is to stick to it.

One question was not touched upon at all, and that was the question of the dental nurse. Now it ought to be enacted by law or some way discovered of fixing the privilege of the dentist's assistant. I have not worked out a bill of that kind and it may be possible that the position of dentist's assistant or nurse could be fixed. A dental assistant is certainly valuable, and I consider—after having one for twenty-five years, that she knows a great deal and sometimes more than I do. I frequently refer to her as to the shade of a tooth, and if she says, "I wouldn't use that shade," or "I don't think I would do it," I am cautioned, and while I don't take it too seriously, I know that just in the matter of a proper shading of a tooth, I refer to her and save time and a great deal of trouble. I think the professional man's time is too valuable to be given up to work that can be done more efficiently by a trained assistant as well as making matters run more smoothly in the office. Those of you who have not an assistant I would advise you to try it. I thank you, gentlemen, for listening to my address and for the criticism offered, and I consider myself well repaid in having these few minutes discussion.

DISCUSSION OF THE PAPER BY DR. JOSEPH A. GARDNER ON "DENTAL PEDIATRICS."

DR. WM. MEYER:

The paper you have been listening to is one of the greatest interest to the medical man as well as to the members of your profession, because the charges brought against us by Gardner are true. It is true that a great many doctors do not appreciate the gravity of caries in children so I want to take my share of blame in the beginning and to express my appreciation of the very helpful paper Dr. Gardner has brought to us. One of the things is particularly true, not every man is gifted with the knack of getting on with children; filling teeth is a difficult operation. Medical treatment is bad enough but dental treatment is even more difficult. I have been repeatedly told by mothers that "Dr. So and So can do nothing with my child." The scope of the dentist's work is perfectly enormous, every person coming into the world is in need of it. I hope it will be an inspiration to you on account of its very size. Any one who has had the opportunity of examining the men in the street, if you look through their mouths you would be probably amazed at the condition you would find, but by starting in and teaching the mothers, in a generation it would be possible to change the conditions.

I remember when I was an interne in a hospital in the mill district, I went into a drug store and asked for a tooth brush, and couldn't get one, the clerk told they didn't carry them because there was no call for them. That is true of all over the country, but make use of your society, in order to make this education effective.

Now, of course, the ideal way of dealing with the situation would be to have the children brought early and kept coming. That is the only way, to have them come at intervals of three or four months, as Dr. Gardner has suggested. In the early period of a child's life is when ricketts appears. Ricketts is one of the conditions that could be prevented by treatment of the teeth. Unfortunately ricketts is an accompaniment of poverty; ricketts is the result of poor feeding, poor ventilation, and the result is that the child suffering from tooth defects is necessarily from the people least able to pay for the care of a dentist, therefore the suggestion of the doctor for the development of a free dispensary is the only solution. No private organization could shoulder the responsibility in so far that the doctors should not be paid, but the work should be paid for by the country, but the well to do also shamefully neglect their children's teeth.

When the ideal way is impossible and the child is not brought to you until advanced diseased processes are in the mouth what is to be done? I have frequently had a condition—a pathological condition that corresponds with a large number of cases of very bad teeth that have been passed upon by some dentists as teeth that nothing could be done with at the present time. Now, I don't believe that is true about the representatives of the dental profession that are here today. I believe that you have taken the position that Dr. Gardner has taken, but there are so many men who will save a tooth rather than a heart. Now, I would like very much to hear in the discussion some information in regard to the saving of these permanently injured temporary teeth. I cannot believe there is any anatomical reason for their retention in the jaw, and where the whole tooth has become decayed and the root also, I cannot believe there is anything to be gained by the retention of the tusk in the mouth. Certainly it is not to the interest of the child as a whole.

Talking about the relation of the carious tooth and diseased gums, and the relation of the teeth and the tonsils. In infection the drainage is through the gland and not through the tonsils, but the tonsils are subjected to a constant bathing in this fluid, and then the child is told it must have its tonsils taken out. That isn't so. Physicians are apt to be in error, they blame the tonsils when the teeth are at fault. I have seen cases of it in the Milwaukee hospital. I have also seen cases where tonsils have been ordered removed, but after the mouth had been cleaned out the tonsils had not to be removed at all.

In regard to systemic infection the case represented by Dr. Gardner was very instructive in character, but you must remember that there are many cases where there are not such outspoken symptoms as described; there are cases in which the mouth is the last place looked into, and that is where the seat of the trouble is. The mouth is just as important in these cases as any other organ.

One word of caution in regard to the eruptive fevers and spreading the idea that you can prevent them. The most serious complications in eruptive fevers are due to second infection and I do not believe you can fairly say that you can prevent the appearance of eruptive fevers. The eruption of a tooth is a purely physiological function and I always carry a gum lancet in my bag.

Before closing I want to say one more word about this important matter—the enormous help the medical profession has received by the development of orthodontia. My being here this afternoon is an indication of the close co-operation that has developed between the professions and I thank you, Mr. President, for inviting me here. The two professions ought to be on the closest terms in order to accomplish results they are aiming at.

Dr. E. A. Guilfuss:

I assure you it was a great pleasure for me to read Dr. Gardner's paper and much more so to have heard him read it this afternoon. One of the statements made by Dr. Gardner was the fact that he though of Dental Pediatrics as a hobby of his, and I was glad there were others as well as myself who felt that way on that particular subject. I know there has been no greater satisfaction during my own practice of over twenty-five years than the satisfaction that has come to me through my efforts in that line of work. I am frank to say that the phase of Dental Pediatrics that particularly interested me and to which I devoted my energies and efforts was that belonging to infant dentition, not that I felt I had anything new to give the profession on the subject, but much to my surprise eighteen years ago I learned that many men in my profession did not thoroughly appreciate the conditions that present themselves for their attention, and as a consequence were neglected by them. The efforts made in the care of children's mouths were not new. My teacher in pathology in the University of Pennsylvania—at that time back in the 80's—I well remember the conditions he presented to us in his lectures seemed to us so obvious that we went to sleep during his lectures. I was some years in practice before I learned that most of the men that were following the same line of life work that I was were not awake to the necessity of the care of teeth in the mouths of children.

It was only through the fact that I was called in to alleviate pain caused by delayed dentition and the dentist had delayed to lance the gums, did I realize that every dentist did not feel as I did and understand the conditions as I had been taught to understand them, the conditions of the mouths of babies. I have nothing to add to what Dr. Gardner has said. There is much to be done in the line of work of caring for the infant during the dentition period. There are phases of the work which he touched upon, but I do not feel called upon at this time to present to you, but I will read to you from a reprint which I had made for the society in 1906:

"No branch of dentistry, it seems to me, is of more interest at the present time, than that involving treatment of the conditions arising from pathological first dentition. This mainly for two reasons. First: because the patient is at an age when it is impossible for it to understandingly manifest its pains and troubles and therefore should be an object of our particular solicitude. Second: because it has been my experience that as a general rule the person who is usually charged with the care of the child at this age, the family physician, has either not a proper conception of conditions as they exist in the mouth at this time or else is adverse to pursuing the course and method of treatment generally advocated by the best and most advanced teachers of dentistry, that is, the deep and thorough lancing down to the erupting tooth or teeth.

"I am willing to concede that dentition is more generally normal than otherwise and that the more aggravated and serious symptoms are comparatively met with in children otherwise healthy, and who receive proper care and attention as regards food and surroundings, still I believe that dentition is more frequently the cause of minor pathological conditions than is usually supposed, and recognizing the serious conditions that may be caused by erupting teeth, I know of no reason for not making the rule to lance in all cases where there is the least possibility or even probability of the pathological conditions manifested, being due to an erupting tooth, no matter what the stage of eruption. By lancing, I do not mean scarifying the gums, but deep, thorough cutting down to the tooth. The etiology of this condition is not the pressure of the advancing tooth against the overlying tissue, but the pressure of the jagged unformed roots, which have elongated due to their growth and have not room to advance because the tissue overlying them has not been proportionately resorbed, back upon the engorged and hypersensitive pulp. Lancing makes it possible for the tooth to advance, the pressure is relieved; pain subsides and conditions return to the normal. Consequently relief is often afforded even when the tooth is not nearly erupting."

In a subsequent paper which I read before this society in 1909 I presented some views on infant dentition which I gave from the time of Hippocrates to the present time:

"The main cause of the number of complicated systemic disturbances concommittant to difficult dentition lies in the undue degree of pressure, not upon the covering congingival tissue, but against the unprotected and highly sensitive pulp. The pain and irritation which are thus established gives rise to nervous disturbances, which in turn lower the vital resistance of the infant thus predisposing it to a number of diseases of an infectious character. It is in this way that we can account for the serious digestive troubles which almost always accompany the difficult cutting of the temporary teeth.

"The writer is aware of many cases in which infants were almost instantaneously relieved through gum-lancing, and is fully in accord with the method advocated by progressive pediatrists to the effect that the gum should be lanced as soon as signs of local irritation appear. His experience is confirmed by that of many other dental practitioners who have successfully treated infantile disturbances due to difficult dentition by lancing of the gingival region covering the inclosed teeth.

"The parallel between the physician, who refuses to recognize the necessity of lancing the gums in these cases and the dentist who administers chloroform for the extraction of a tooth, is complete."

In a previous paper I stated that I believed that dentition was a matter much neglected by us as dentists and that not usually not due to any fault of ours.

"The dentist is as a rule not consulted in cases involving dentition unless he has been able previously to educate the parents. The physician who is called in to attend the ailing infant has usually not a proper conception of conditions as they exist—certainly not as far as the growth of the teeth are concerned.

"If you have followed my presentation of the views on this subject, entertained by various authorities, particularly the medical ones, you will have noticed that in by-gone ages from the beginning of medical lore and knowledge it grew to be the belief that practically all or any of the diseases which might affect a child during the dentitional age were always due to teething. That as medical knowledge advanced and the etiology of the various children's diseases was better understood, the position was gradually taken by medical writers that dentition was never a direct causative factor. That medical men as a rule even today believe that whatever disturbance may be caused by the advancing tooth is due to its pressure on the gum, and that most of the arguments advanced the possibility of dentition being a factor in systemic disturbance is owing to the fact that there is not a proper understanding of the embryology, histology and anatomy of the teeth on the part of the physician, who none the less is the one who sees most of these cases, and that he seldom considers it necessary to call the dentist in consultation.

"The majority of dental teachers and writers, however, while recognizing that under ordinary circumstances dentition is a perfectly normal physiological process, and that the average influence of teething as a disturbing element has at times been overestimated, nevertheless believe that it is a factor which should receive more consideration than is at the present time bestowed upon it by the medical practitioner who is usually charged with the care of the infant."

Now, gentlemen, I could go on and present to you many phases of this work, but I do not feel I am called upon to do so as they were not dwelt upon in Dr. Gardner's paper on the general subject of Dental Pediatrics. It has been my good fortune to be able to work with such men as Dr. Meyer, who this afternoon discussed Dr. Gardner's paper, and it is largely through the efforts produced by collaboration that the results we seek are obtained. I feel that the present is a very propitious time to carry into the minds of the men assembled here the conditions under which it is proper for us to do our share in rectifying these conditions. It is work that requires co-operation for the good of the community and it is proper that the community should carry the burden of this, for we are not able to carry it all ourselves.

In the last few years through efforts in this direction there has resulted the establishment of the Eastman clinic in Rochester and the Forsyth clinic in Boston. The Board of Education has established a free dental clinic for children whose parents are unable to pay for dental attention in Milwaukee. The time is more auspicious than ever before and I believe that that we cannot but feel after the discussion this afternoon, the need of work in Dental Pediatrics. I thank you.

Dr. Gardner (closing the discussion):

I am very grateful for the discussion this paper has excited and before I answer some of Dr. Meyer's statements I want to say to you that no impression or intimation had been intended that there was anything new or original in my paper. I will state, however, that since the time of Hippocrates, there has been only a slight endeavor manifested among ethical dental practitioners regarding the care of children's teeth. So far as I am able to determine very little attention has been directed to the condition of pathological conditions after the eruption of the deciduous tooth. It is very pleasant, indeed, to know that you have men here who have given this work so much attention and thought. If others would follow in the footsteps of Dr. Guilfuss conditions would improve very rapidly, but unless we all put our shoulder to the wheel and do all in our power to make this propaganda a good one, it will die as all other propagandas have done.

In regard to getting along with children: Dr. Meyer certainly struck the nail on the head when he said it required special characteristics and special inclination on the part of the operator to educate a child to the point of becoming a good patient. So many of us are not willing to spare the necessary time and that is why I repeat that it be made a specialty with remuneration according to a specialist charge. If you can get a child before six months and feed him a little cinnamon water and be considerate you will have made a good patient for life, if you do not accomplish more than that you have accomplished a great deal.

The medical man thinks it is right that he should give freely of his time for charity, the dentist cannot entertain that idea; why the doctor gives half the night and quarter of the day to charity, the dentist gives a quarter of an hour in a year if he has to. I have started out on some proposition to care for orphanages and hospitals for incurables, I could get a few out for the first time, but to fill the second appointment it was impossible out of ten men starting out on an orphanage to get more than two to remain for ten days. It is a burning shame that the dental profession is so indifferent to humanity and charity.

As to the desirability of saving the teeth: It is exceedingly desirable that you save them provided you can save them in a healthy condition. It is absolutely erroneous for any dentist pretending to know pathology when he meets it to preserve any foreign infectious body. It is absolutely wrong to save a tooth in a child's mouth to prevent an irregularity, and that is all that is accomplished by retention, and that is the reason why dental pediatrics is so important. You cannot do anything for the child when the pulp has been exposed, so if you do not get that child and apply restorative measures you will not have been able to overcome the predisposing cause of that infection, so it is a question of giving up the child unless we see it in time.

In regard to eruptive fevers: I meant to advance this suggestion. That eruptive fevers are due, I believe, to a lowering of the vital resistance. An infected tooth might cause a lowering of the vital resistance, and if you did not have a lowering of this vital resistance you might prevent a certain percentage of the eruptive fevers. We can help by donating our services that poverty is not able to pay for.

In conclusion I wish to say that I feel a little jealous of Wisconsin; I thought that the South possessed all the hospitality there was, but you have robbed us of our old reputation. I have never met such hospitality as I met last night.

CHICAGO DENTAL SOCIETY.

The regular monthly meeting of the Chicago Dental Society was held in the University Building, 31 W. Lake street, on Tuesday evening, September 18, 1917, at 8:00 o'clock, the President, Dr. P. B. D. Idler, in the chair. Dr. G. Frank Lydston delivered a lecture on "Syphilis of the Mouth and Throat."

DR. TRUMAN W. BROPHY:

Mr. President: It was very kind of Dr. Lydston to give up an evening of his busy life and come here to discuss this question. When I was asked to open the discussion on this subject I remarked that it was scarcely necessary, because I knew that Dr. Lydston, with his large experience in this field of surgery, would present a most systematic and exhaustive discussion of the subject. I knew that he would give to us the essentials so far as they related to the whole matter, and I am satisfied that what he has done will convince all that my opinion of his work was correct. I have no criticism whatever to make regarding the remarks of Dr. Lydston, but can only express my appreciation of his work and say that I have no doubt that the views which he has presented here this evening will be endorsed by all men who know the subject as he knows it.

When he spoke of conditions abroad I was reminded of an experience I had in the city of Dresden at the Hygienic Congress which was held there in 1907. The buildings which we visited and the reports which were presented were most impressive. I suppose Austria would not be exceeded by any other country in the prevalence of this disease. It is customary when a patient comes in a hospital in Vienna not to ask him if he has syphilis, but to ask how long he has had it—assuming that he has the disease. The tables or statistics were presented in great buildings—erected by the Austrian Government, and they had buildings there equal to one whole square in this city and which were built expressly for their exhibition in the field of hygiene. Great tables were spread over walls larger than the walls of this room to show the prevalence of venereal disease, and as we read them over we were, indeed, much surprised to find that more than 75 per cent of the people were infected.

I am not going into any description of this disease, but I want to say a little something further on the matter of infection. More than twenty years ago there was a tuberculosis congress held in this city and for some reason I remember the committee in a moment of weakness called on me and asked me to deliver an address in that congress—to occupy an hour, on the subject of tuberculosis from the oral point of view, how the infection of tuberculosis is manifested in the mouth, and anything I might wish to say on hygiene, prophylactic measures, etc. Just at that time I had a patient under treatment, a boy about nine or ten years of age—I think some of you may remember that boy. He had a complete destruction of the lips, cheeks and nose, one eye was lost and the other was going when he came to me. The boy had been in the public schools until his condition became so bad that the authorities expelled him. In that school he made use of the same drinking cup that other children used —any child having a little fissure in the mouth making use of the same cup might contract the disease, and no doubt some of them did. On that occasion I made the statement that there should be individual drinking cups in the schools. The newspapers took it up and made all sorts of sport of my remarks—but drinking cups are used now. So good a man as Dr. Ephraim Ingals laughed at the idea and said it could not be done. On the subject of sanitation, of hygiene, or cleanliness, I made the statement then that the time must come, and soon—I hoped, when the ladies instead of sweeping the sidewalks with their skirts would be compelled by law, if need be, to cut their skirts so they would not reach within four inches of the ground. Then the newspapers took that up and made pictures of girls with their skirts made as suggested and commented on how they would look dressed in that way. Not only the drinking cup but so many things should be considered. Dr. Lydston has mentioned some of them. Do you ever think when you go into a restaurant what chances you are taking? You use the forks and the spoons, and the cups and the dishes, and do you ever think who used them before? They don't always wash these things clean. In some places they do, but there is always an element of danger in using them. More than that, napkins, towels and so on, may not be clean, and then it has been charged—perhaps justly in some instances, that the dentists are sometimes not particular enough in sterilizing their instruments. Great changes have been made in the last decade; instruments have been made that can be sterilized without spoiling, and linens and hands are kept clean. One thing I want to mention is the sterilization of the hands. Whenever you are in doubt about the condition of a patient protect yourself. Sometimes I am in doubt about the condition of my patients, so I put on gloves, not for the purpose of avoiding infection of the patient, but for the purpose of avoiding infection of myself. You, who are operating all the time, if you follow the directions given by Dr. Lydston tonight, will learn to make the diagnosis of syphilis and carcinoma and lesions of a benign character, and when you are in the presence of an infectious disease you will wear gloves. It may seem unreasonable for a dentist to wear gloves, but it is no more unreasonable than for a surgeon. Dr. Lydston will know who I mean when I say that an eminent gynecologist of this city, a man with a reputation beyond reproach, lost his life through syphilitic infection incurred while operating. I presume Dr. Lydston could tell you of many men who have become infected with this disease in their operative work. We can, by an effort to observe and by the use of our instruments, our excavators and all the instruments we use in the extraction of teeth, keeping them clean and keeping our hands free of abrasions, do much to avoid infection. Whenever a slight abrasion occurs it should be thoroughly cleaned, and one of the best ways is to put it under hot water, promote the flow of blood and cleanse the wound thoroughly and paint with tincture of iodin, and by so doing you will be able to avoid the contraction of disease.

I might mention two other things that are very common among a certain class of people, especially working men. I have seen with horror men working on the street chewing tobacco which had been bitten from a plug which had been passed around from one to the other. They will also use pipes of one another. How can they avoid contracting disease when it exists?

I want to say a word about the primary lesions as they appear upon the lips, cheeks, palate and tongue, and the differential diagnosis between syphilis and carcinoma. Two of the most prominent men in the world lost their lives through carcinoma as the result of broken down teeth. It has been mentioned by the essayist of the evening that the effect of a broken down tooth is to keep up an irritation and ultimately develop into carcinoma. Gen. U. S. Grant lost his life in that way and you all know the experience of Emperor Frederick of Germany, who lost his life in the same manner. The description of either case is so identical with the description of the other that to describe one would be to describe the other.

Syphilis seems to have the most prevalent effect on the bones of the nose and of the hard palate. You see many saddle noses where the bones have become necrotic. Perhaps the bones of the nose and hard palate are not so well nourished as the other bones; in any event they become involved more frequently than any other bones of the body.

Let me say just one word—what are you going to do when you see these little sinuses that are formed in the hard palate? A. sinus is grey, the tissues have a disagreeable odor, and an exudate of greyish-white, paste-like fluid. You put in your instrument and if you carry it into the sinus it comes in contact with denuded bone. What are you going to do with it? That is one of the most exacting operations I know of—how are you going to remove the sequestrum? Are you going to cut open the palate and take out the dead bone en masse? Oh, no. You want to operate so the patient will be left in as nearly a normal condition as possible. Every operation should be so performed that when it is over the parts may be in as nearly normal a condition as possible. How can you remove a piece as large as a twenty-five cent piece and leave the patient without a large hole? You can not do it. The necrotic bone may be taken out through the nose piecemeal without injuring the palate further. If taken out little by little without destroying the soft parts, the sinus is likely to heal, and the patient will not have his voice permanently injured.

I want to say one word about the evidence of syphilis on the teeth, the so-called inherited syphilis that comes in the faces of enamel of the teeth known as Hutchinson's teeth., It has been said that Hutchinson's teeth are pathognomic of syphilis, but it is not so. You have all had cases of these small pits which run in lines across the teeth and if you know your anatomy you can tell at just what time the fever occurred in the child. Any eruptive fever, no matter what, will produce an eruption of the skin and a disturbance of the mucous membrane will be followed by the indentations made in the teeth, along their borders or across them, known by surgical writers and syphilographers as Hutchinson's teeth. They are not due to syphilis any more than they are to scarlet fever or any other eruptive disease. They are the result of inflammation which prevented the proper nutrition of the tooth enamel at the time it existed. This statement was endorsed most emphatically by Dr. G. V. Black when I made it many years ago.

Regarding the sequestrum that forms in the mandible. At one time I had a case of syphilis that completely destroyed the entire mandible. I did not take out the dead bone but kept cleaning it and washing it, and by and bye new bone developed. This necrotic mandible was in a measure surrounded by new bone and the necrotic mandible served as a framework to maintain the proper contour of the face and chin, which would have been lost had I removed it and the patient would have been deformed forever. But holding the chin out in that way enabled us to get a very good new mandible. After a time we made for him a set of teeth which served him well, as the entire bone was reproduced.

I have had just such experience as Dr. Lydston in the use of salvarsan and the Wasserman test. Any man who has had clinical experience enough to have an opinion would decide before the test was made.

In regard to the diagnosis of cancer and the microscope. Instead of taking out a piece of a growth and examining it several days before the operation, I take the tumor out and then take the specimen to the laboratory and have the examination afterward. That saves a lot of time and the results are always the same. I think it is a very satisfactory thing to do with patients because the cancer must be removed anyway. When the cancerous lesion has not extended so as to involve tre lymph glands it is a local disturbance, but becomes constitutional by allowing it to remain.

Dr. Frederick B. Moorehead:

I want to fully approve Dr. Lydston's discussion of the subject, and emphasize three or four of the more important points. Syphilis is a constitutional disease and should, therefore, be treated by the internist or the dermatologist. No patient should be treated for so serious a disease as syphilis by one who has not a thorough knowledge of every phase of the disease and every patient is entitled to the best. In the country districts, the general practitioner of medicine and dentistry is obliged to address himself to all kinds of work, but in the city specialists are always available, both for the rich and the poor. One of the most serious aspects of the specialist's work is the treatment of patients who have been treated by men who failed to appreciate the seriousness of the situation. There is a lot of secondary surgery made necessary by the poor surgery of men not qualified to do surgery. The shoemaker should stick to his last; the surgeon should do surgery, and the internist practice internal medicines.

Cases of syphilis should be treated by either the internist or the syphilographer.

Syphilis attacks the tissues of the mouth largely because of poor circulation. A cardinal fact in the management of disease is the establishing and maintenance of a normal circulation. No patient will be salivated to whom mercury is intelligently administered, and whose mouth is in a normal state of health.

Irritation of the soft tissues of the mouth either by mechanical irritants from without or chemical irritants from within will give rise to a proliferating endarteritis, which will block the vessels and produce stasis. Under such conditions, large doses of mercury will be deposited directly into the tissues of the mouth and produce well known results.

The dentist has no greater function than the removal of those things which interfere with normal circulation.

Dr. Lydston is right in stating that much syphilis is innocently contracted. Man is protected against disease by a healthy epithelium, both on the skin surface and mucous membranes, and unless there is some break in the epithelium, infection cannot occur.

The dentist may at times be careless in abusing the soft tissues, making an opportunity for the introduction of infection. Syphilis may be, and in fact has been, transmitted from patient to patient by unclean instruments. The individual who has syphilis should be instructed in the dangers of transmitting his infection, and taught the simple methods of personal hygiene, especially in the uses of eating utensils, towels, etc.

Dr. Rosenow has done a fine piece of work on the elective localization of the streptococcus, and what is true of the streptococcus, may also be true of the spirochete, and patients with syphilis may pass through the primary and secondary stages of syphilis without serious reaction and later develop serious lesions, involving important tissues: e. g. syphilis of the central nervous system. One must bear in mind the quality of immunity possessed by the individual patient, whether natural or acquired.

The Wassermann test is like any other laboratory test, valuable if intelligently conducted and used as corroborating evidence. One is in danger in the practice of any phase of medicine in over-estimating the value of any single method of diagnosis. The man who ignores laboratory methods, and relies wholly on clinical findings, is quite as unreliable as one who puts all his emphasis on the laboratory and ignores clinical findings. Every equation should be carefully balanced in arriving at conclusions.

During my senior year in Medical College, I registered for a course in the laboratory diagnosis of blood lesions. At the conclusion of the course, which illustrated every item in laboratory technique, Dr. James B. Herrick, who gave the course, made this very significant statement:

"Gentlemen, don't forget to look at your patient once in a while."

As to the occurrence of carcinoma at the site of old syphilitic lesions, it must be true that syphilis acts in a two-fold capacity. First, by reducing the normal resistance of the individual, and also by its definite irritating effects. That irritation plays an important, exciting role in carcinoma is common knowledge.

Probably the most important matter in the whole problem of syphilis is early diagnosis. There is an interesting and valuable article in the last number of the *Journal of the American Medical Association* on Syphilis as an army problem, prepared by a committee of dermatologists, headed by Dr. W. A. Pusey. The management of the disease is outlined in detail and great emphasis is laid on early-diagnosis. The finding of the spirochete in the chancre secretions, makes abortive treatment possible so far as it may be possible to abort syphilis.

The aspiration of the contiguous lymph node, using an ordinary luer syringe with a short fine needle, is a valuable means of making an early diagnosis when the spirochete is not found by an examination of the chancre. The lymph node is often rich in spirochetes.

When the initial sclerosis has been overlooked, the early diagnosis of the secondaries makes it possible to cut short the constitutional harm and materially reduce the likelihood of destructive tertiary lesions.

Where the secondary stage has been ignored, overlooked, or poorly treated, the early diagnosis or the tertiary stage may save the patient from serious and deforming lesions. For example, the recognition of syphilitic periostitis involving the bones of the nose and the hard palate, with intelligent treatment will save the patient from extensive necrosis. While it is not the province of the dentist to treat syphilis, it is his plain duty to thoroughly acquaint himself with the appearance of syphilitic mouth lesions, so that he may be able to protect himself and other patients from harm, and to refer cases to competent men for treatment.

In every city like Chicago, and cities much smaller, there is ample opportunity to see cases of mouth lesions. In the various medical clinics and dispensaries abundant material for teaching purposes is found. Every dentist in Chicago may see numerous cases of chancre, mucous patch, or gumma.

In closing, let me repeat that dentistry should be done by the dentist, surgery by the well-qualified surgeon, and general diseases like syphilis should be managed by the well-qualified internist or dermatologist.

Dr. Herbert A. Potts:

I think, from the address and discussion this evening, you have had brought home to you the multiplicity of lesions in various parts of the body. As has been said, it is beyond the pale of the dentist to do very much with this except to suspect and, suspecting, do something, and that something is to impress upon the patient the importance of proper treatment and direct him to a syphilographer. These lesions occur in all tissues of the body—the tertiary lesions in particular, the secondary in fewer and the primary lesions in still fewer locations. My experience is that the dentist seeing some peculiar lesion in the mouth, particularly if it smells badly, will look at it for a moment—what is it? "I don't know,—maybe syphilis." That is all the attention he pays to it. It is not to be hoped that the dentist will recognize and treat all these lesions. We do have the primary lesions in the mouth, but the secondary ones are the principal ones which you, for your own protection, should recognize or get the patient to see somebody who will. Continued irritation keeps up these lesions. Don't be touching everything with nitrate of silver or a caustic stick—you may be adding to the lesion. The secondary lesions may continue for years with interruptions, particularly in smokers. Given a patient who comes to you—and you have all had patients who complained of the recurrence of something in the mouth, it may be canker sores, or the secondary lesions of syphilis recurring when treatment has been left off or the patient has jollied himself into the belief that he never had syphilis. Continued irritation is very apt to bring back the infection and it will be just as dangerous as it ever was. Spirochetes have been found in the scars of a primary lesion a long time after the patient was free from the clinical manifestations, and the patient is in danger of tertiary lesions cropping out almost any time in the absence of active treatment and even sometimes after it. I believe there are in the malignant type cases which cannot be controlled.

There is one point which I wish to emphasize—where the dentist can do a great deal in the matter of teaching. Dr. Lydston spoke of the duty of the physician in sending his patient to the dentist for proper treatment, but the physician should not neglect to tell the dentist that he is dealing with a syphilitic. That is often done, but there is not enough stress laid upon it. What does this treatment mean? Not the simple treating of obvious cavities or simple cleaning of the teeth. Those things are very important and the teeth should be properly scaled and the cavities filled. The physician wants all sources of irritation removed. Consequently, don't polish his teeth and let him go, but get a fine scaler which will go down beneath the gums, remove the over-hanging borders of fillings—which you don't do every day. I venture to say that in every patient who comes into your office you will find an overhanging margin which is irritating that gum. A crown is in the majority of cases an irritant to that gum, particularly in the interproximal space. These are the things that the syphilographer wants removed because that irritation will further irritate the membrane. It will stop his treatment and the patient will develop symptoms in the mouth which will confuse the physician.

Dr. Lydston has intimated that a patient can be treated too much. If there are lesions in the mouth he is going to be misled. Furthermore, the continued irritation by mercury itself is a bad thing. It has just been stated that this is the cause of carcinoma, and carcinoma we know develops in many cases upon chronic lesions, particularly of the mucous membrane and the skin.

Dr. Lydston spoke of necrosis. It may be that I have been misled by both observation and teaching in that the ordinary pus infections of the mouth were made very much more extensive upon a syphilitic basis. That may be an error. As a matter of fact, we know that necroses do develop from small lesions, small infections, from infections which we see every day that do not lead to extensive necrosis, and on examination we find that that patient still harbors spirochetae. Whether or not that necrosis is due to a secondary infection or lowered resistance due to the spirochete, or whether in its presence the spirochete and its organisms become active I do not know; but I know that the syphilitic patient is a poor patient for bone surgery. Many a case of ununited fractiure will get well within a short time if anti-syphilitic treatment is carried out.

As to the Wassermann reaction, I think we may reason backward in determining syphilis of the blood. In the tertiary lesions of the spinal cord and blood we get a positive Wassermann of the spinal fluid and a cytologic count as well. One may just as well expect to get a negative Wassermann of the spinal fluid if the patient shows no symptoms of cerebrospinal syphilis. I say that with modification because many obscure cases are cleared up by a positive Wassermann of the spinal fluid. The thing I want to bring out is that the disease must be of the spinal cord or brain or all those tissues to get a positive Wassermann. The Wassermann reaction, Dr. Lydston said, has done almost more harm than good. I think we younger fellows have forgotten to utilize our faculties. The older men did not always have all these laboratory methods. They made their diagnoses from observation and many times empirical methods—but they made diagnoses. Some of the most classical diagnoses we have today were made by men who had no such helpful tests. Consequently, we should get all these things together and then try to form an opinion as to what is wrong with the patient, and that is about as far as we can go. I think the dental profession has not really gotten down to business and the different members of it have not tried to differentiate the different stages of syphilis. If we have a lesion in the mouth and we have any idea it is syphilitic, try to find out whether it is a primary, secondary or tertiary lesion. Get the chronology of it and the symptoms which will enable you to get a history. In the early primary stage there will be no positive Wasserrmann and at times it fails in the secondary stage. Furthermore, I believe that any lesion in the mouth which does not submit to the ordinary routine treatment within two weeks should be looked upon as serious. If you do not know yourself what to do, send the patient to someone who does know. Don't fuss along with any lesion in the mouth which will not heal.

Dr. H. Nelson Orr:

Mr. Chairman, Ladies and Gentlemen, and Dr. Lydston: I hope you will pardon me if I digress a little in the discussion of this paper, but there is one point that I wish to bring up here. I would like to know what is going to happen to the men who come back from Europe when the war is over. At the present time on the Western Front there are 700,000 men who are infected with syphilis. We are sending over possibly 3,000,000 men. Of a necessity they must be clean when they go into the service. The question is, how to keep them that way? I don't know what remedy can be used unless it is prophylactic measures and instructions given to men when they go on leave, but I think it should be taken up by the medical and dental societies of the counttry and insisted upon to protect the men. The men won't protect themselves, as they are ignorant of the danger. There was a time in the Navy when a man who had shore leave had to say "Yes" or "No" when he came back. If he lied about it he was court-martialed. I think the men in the Army should be handled in the same way, so that they can be taken care of, whether they want to or not. I have had some experience in this line in the Philippines, fifteen or eighteen years ago, and I know that this disease and other venereal disease put more men out of action than all the fighting we did in the Philippines or Cuba, and it is a serious thing. It goes on from generation to generation and you breed it in your children. The danger to the innocent of infection by the use of drinking cups, towels and eating utensils has been well covered by the essayist. There has been some talk about quarantining it; this law came up in Indiana with a test case, but it lost out. There should be a national law, and there should be military regulation putting these infected men into camps where they may receive treatment before being mustered out of the service.

In closing, allow me to suggest a remedy:

First. The attitude of mind of the man must be changed. For instance, I have had any number of men tell me that the "Gon." as they call it, is not as bad as a hard cold; also there is the belief that a person infected with gonorrhea or syphilis is immune to yellow fever, smallpox and malaria; in fact, I know two men who deliberately became infected during the campaign of '98 so that they would be immune to yellow fever. This belief should be broken down by instruction from competent medical officers.

Second. All cases that occur in the service should be quarantined with loss of pay, while in quarantine. This penalty to keep some men from taking this method for relief from duty.

Third. The holding of all infected men in detention camps until they are safe to return to their homes.

This last is a penalty that would make a man more careful as to his conduct while in the service.

Dr. Lydston, closing:

In calling attention to the peculiar nature of the necrosis occurring in the nose about the jaws, Dr. Brophy clearly emphasized what I already had brought out and, I think, explained on the ground of tropho-neurotic changes in the bone. Another point, in confirmation of this view is the fact that when these bones come away they come away as cleanly as you could dissect them with a knife. They are not like sequestra from other parts of the osseous system. Especially are they different in that there is no involucrum and the bone is never regenerated.

I was a little afraid that possibly some of my remarks in regard to salvarsan and the Wassermann might have been misunderstood. I was not condemning them. They are valuable under certain circumstances and we could not very well get along without them in many cases, but in the majority of instances the work must be done by the general practitioner in the small places—often also in the large places—and the value of the method is determined largely by the person who uses it. There has been more "bunk" perpetrated regarded salvarsan and the Wassermann than regarding any other scientific discovery in medicine. Take, for example, the furore that attended the discovery of salvarsan. There are reputable men in this country who plunged into its use because they wanted to plunge while the commercial going was good. They didn't care whether the remedy was as efficacious as Ehrlich said it was or not. Patients flocked to specialists to be cured by one dose of salvarsan. Someone wrote to my friend, Dr. Evans—the really eminent editor of the health column of the *Tribune*—and asked: "Is 606 what it is claimed to be? Does it cure syphilis?" And he replied—"Yes; 50 per cent of cases are cured by one dose, 80 per cent by two doses, and practically 100 per cent by three doses,"—which statement was 100 per cent pure rot. Dr. Evans had taken at their face value the exaggerated statements regarding salvarsan.

You can understand what a struggle we have had in the face of such unfortunate circumstances as that, and the belief that we have a specific that is all that it was hoped it might be. The layman and many ignorant physicians believe that there is such a thing, as Ehrlich stated it, as "a complete sterilization of the body" by one, or two, or three doses of salvarsan. If you know biology you know that the cells of the human body are less resistant to chemicals than are the microbes that infect them. Some people entertain the notion regarding disease that all we have to do is, so to speak, to discover a three-cornered disease and a three-cornered germ that causes it and then fashion a three-cornered club with which to kill it.

A singular thing about that old idea of stamping out disease is that we always are reverting in type, in science as elsewhere. In treating syphilis we reverted when salvarsan came in. Knowing that mercury was curative we once thought that if some mercury was good, more mercury would be better. So it was—for the disease, but not for the patient. We long ago abandoned that view of mercury, but some of us now have a similar idea of salvarsan.

Some talk of the "abortive treatment" of syphilis—I don't at all believe in abortive treatment. By giving a variable number of doses of salvarsan we do get a negative Wassermann, hence some persons think that the patient is cured. He is cured until he develops it again. Like the Hot Springs quacks, these fellows say: "We will cure you in six weeks of treatment and if you have syphilis again, come and see us some more." The same fellow who says a negative Wassermann does not mean anything will talk a blue streak about the abortive treatment of syphilis. How does he know it is "aborted"? I am in touch with dozens of cases that were treated years and years ago who have negative Wassermanns and no symptoms, and other cases that have negative Wassermanns but absolutely have syphilis just the same.

There is a point that I want to impress upon you because you come intimately in contact with the layman. Many times you will have a chance to tell the truth to the patient who thinks that because he has a negative Wassermann, he has been cured by so many doses of salvarsan. There stands before some physicians the specter of losing a patient, hence they do not always tell the truth. That is why I say that there is danger that salvarsan and the Wassermann test, taken by and large, may do more harm than good, and why I fear that, within the next ten to twenty-five years—because we are relying too much upon the Wassermann test and salvarsan—there will be more uncured syphilitics than ever there was in the history of the disease—since, at least, we learned to use mercury intelligently.

Not long ago one of our distinguished syphilographers read a paper on 200 cases of syphilis successfully (sic) treated with salvarsan. I discussed the paper and this was my discussion: I said to the essayist: "If you were restricted to one remedy for syphilis and you had your choice between salvarsan and mercury, which would you use?" He replied, "Mercury," without any challenge from the large audience, which, in my opinion, demonstrates the exact status of the treatment of syphilis.

Referring to the cases of Grant and the Emperor Frederick: The reason they died, in my opinion, was because of disagreement among doctors. My belief is, that in a case where there is a suspicion of malignancy safety lies in doing an operation. "Suspicious" tissues in bottles never make any trouble. If the eminent men in question had been humble hod carriers, they might have had a chance for their lives. As it was, the doctors merely tried to find some unusual diagnosis to fit an ordinary case—with disastrous results.

Referring to infantile and hereditary syphilis, I think I was the first to call attention to the matter of lesions due to malnutrition. I long ago said that in a large proportion of cases so-called hereditary syphilis was not syphilis at all. In many of these cases the lesions are the result of nutritive perversions transmitted to the children by syphilitic parents. They are merely the remote results of syphilis and the same thing occurs in the adult who once has had active syphilis. They really are not manifestations of active syphilis at all, but are malnutrition symptoms. Active syphilitic lesions and nutritive perversion symptoms may exist side by side. Hutchinson had an intuitive perception of the truth, for he used to treat scrofula and enlarged glands with tincture of cinchona bark and bichlorid of mercury, thus showing his suspicion that nutritive perversion and syphilis might be combined.

As to immunity, I believe we are gradually acquiring immunity to syphilis as we have to other infectious diseases. The person who has syphilis and passes through it successfully is not likely to transmit syphilis to his progeny. I suspect, however, that he may transmit a certain degree of immunity. I do not believe that the present comparative mildness of syphilis is due to any improvement in methods of treatment, because with the exception of salvarsan we have not added much to the treatment of 3,000 years ago. In the better class of patients whom we treat in private practice—patients who come to us when the first symptoms appear—we very rarely see mucous patches or skin lesions. Personally, if I did not see such cases in the public clinics, I hardly would know what the severe syphilitic eruptions look like. This is not altogether due to the success of treatment but to the fact that the better class of patients take care of themselves and are hygienically well situated.

Dr. Moorehead made the statement that deficient circulation is the cause of the condition that results from syphilis of the mouth. That is a half truth, but he has the cart before the horse. The assumption is that most of the persons in this room have normal circulation in the mouth, yet one could salivate any one of you within twenty-four hours. Dr. Moorehead is, however, quite right in his statement that the untoward action of mercury is due largely to obstruction of the circulation.

Regarding venereal prophylaxis in the army, I will flatly state my attitude: If it is possible for the United States Government to prevent our soldiers from getting drunk and to prevent any individual from selling or giving liquor to the soldiers, I believe that with equal facility the Government can prevent their exposure to venereal disease. I do not believe in prevention which does not prevent, nor regulation which does not regulate. Least of all do I believe that fornication by the soldier or anybody else is necessary. It, perhaps, may be either a right or a privilege, but I deny that it is necessary. The right of the individual to expose himself—if he ever has any—ceases just as soon as he goes to fight the battles of the United States. Then, too, if he is willing to risk his life for his country, why should he not be willing to sacrifice his vicious indulgences? Now, don't for one minute think that I am moralizing: I am not, but am merely protesting against the official recognition of fornication as necessary. That no individual can control himself is a damnable lie and you all know it.

As to prophylaxis in the case of the men in the Navy, it is comparatively easy—whatever may be said of its ethical status. With the army it is different. They tried it in the Canadian Army in France, and, it is said, 80 per cent or more contracted syphilis. I have heard that some of the men deliberately exposed themselves to venereal disease because they liked it better than they did conditions in the trenches. I have been told that the troops on the Mexican border were given prophylactics. If this be true, what do you suppose the effect upon the minds of the wives and sweethearts and sisters of the soldiers would be if the Government came out and frankly told how the matter of venereal disease was handled on the Mexican border? If the Government should acknowledge that it recognized fornication as a necessity, that it officially sanctioned the soldiers' exposing themselves to venereal disease, what would happen? And supposing the women of the countrty also were told that there are thousands of prostitutes behind the lines in France? Let the United States Government come out plainly and state to the women of this countrty just how it proposes to handle the venereal problem during the war. Will the Government confess that it can control its soldiers in everything *but* exposure to venereal disease? It might be well to consider also the cost of each human fighting machine. Impairing his efficiency is an expensive luxury. A single debauch is likely to put him out of the running. Let it be remembered that the soldier who courts infection is a more serious menace to our country than are ten armed German enemies. If a case of typhus or of smallpox should wander into one of our army camps, or if it were known that our soldiers were exposing themselves to those diseases, the medical department of the army would "throw a fit." And yet, gonorrhea and syphilis in the last analysis are more dangerous than either smallpox or typhus. Supposing even 25 per cent of our enormous army should contract syphilis and bring it home with them? Incidentally, why should sexual vice be recognized as necessary in the Army in France any more than in Chicago. We have abolished the red light district, and some short-haired women and long-haired men think we have abolished sexual vice, "which is to laugh."

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

A RED LETTER DAY FOR DENTISTRY.

October 6th, 1917, will always be looked upon as a day worthy of remembrance by the dentists of the United States. On that date was passed by Congress and signed by the President the following bill:

"*Provided,* That hereafter the Dental Corps of the Army shall consist of commissioned officers of the same grades and proportionally distributed among such grades as are now or may be hereafter provided by law for the Medical Corps, who shall have the rank, pay, promotion, and allowances of officers of corresponding grades in the Medical Corps, including the right to retirement as in the case of other officers, and there shall be one dental officer for every thousand of the total strength of the Regular Army authorized from time to time by law: *Provided Further,* That dental examining and review boards shall consist of one officer of the Medical Corps and two officers of the Dental Corps: *And Provided Further,* That immediately following the approval of this act all dental surgeons then in active service shall be recommissioned in the Dental Corps in the grades herein authorized in the order of their seniority and without loss of pay or allowances or of relative rank in the Army.

Provided Further, That no dental surgeon shall be recommissioned who has not been confirmed by the Senate.

All regulations concerning the enlistment of medical students in the Enlisted Reserve Corps and their continuance in their college course while subject to call to active service shall apply similarly to dental students."

What this means for the dental profession will be better realized in the future than it is today. It grants a recognition to dentistry that it has never before enjoyed, and it places upon the members of the profession a grave responsibility in proving themselves worthy of the status thus accorded them. The provision for higher rank for the Dental Corps in the Army was only just and equitable. It was in keeping with the increasing importance of dental service both in civil life and in the military, and yet, as in all other reforms, it met with opposition. This opposition was broken down by the logic of the situation, and by the energy and devotion of those who had the legislation in charge. Senator Lodge was chief sponsor for the amendment, but unfortunately he was obliged to leave Washington two weeks before Congress adjourned, and in his absence Senator Pomerene took up the matter and handled it in a masterly way. The Legislative Committee of the National Dental Association—Dr. Homer C. Brown, chairman—worked hard and constantly for the passage of the bill, and are entitled to great credit.

The Amendment, which practically exempts dental students from military service and places them on the Reserve list the same as medical students so that they may be permitted to complete their course at college and prepare themselves for graduation, was largely the result of activities on the part of the Committee of Deans of Dental Colleges as outlined in an editorial in the October number of the DENTAL REVIEW. Through a campaign of education, led by the chairman, Dr. Arthur D. Black, at least 25,000 letters went to Washington in the two weeks preceding the passage of the bill. They were sent by dentists, by dental students and by their friends, and it is believed that they were no small factor in riveting attention to this matter and compelling the interest of the Government officials and members of Congress. The dental profession is fast learning the lesson that organization is necessary in carrying on any great reform.

But probably if the actual truth were known, the chief agency which coördinated all these efforts and piloted the provision over some rocky shoals was centered in a man in the Surgeon General's office who accepted a commission in the Medical Corps at a sacrifice to his own personal interests that he might thereby better serve dentistry. From the time Major W. H. G. Logan entered the Surgeon General's office he worked incessantly for this and for other agencies tending to the betterment of the status of dentistry. And be it said that he accepted his commission in the first place under severe criticism from members of his profession. They said he was deserting dentistry, when as a matter of fact he was placing himself where he could do dentistry the greatest service. And he has done it. More cannot be written now for obvious reasons, chief of which is that the man written about would not sanction it, but as one who has been in close touch with his work in recent months has just written: "No dentist in the history of the profession has done more for dentistry than has Dr. W. H. G. Logan in 1917."

In connection with the present status of dental students it may be of interest to publish the following telegram received from the Surgeon General by the deans of dental colleges:

"WAR DEPARTMENT

"OFFICE OF THE SURGEON GENERAL
"Washington

"TELEGRAM

"October 8, 1917.

"A dental student of a well recognized dental school who has been called by Local Board, physically examined, accepted for military service, and desires to enlist in the Enlisted Reserve Corps of the Medical Department should proceed as follows: With such request he must enclose copy of order of Local Board calling him to report for physical examination Form One Hundred Three, affidavit evidence of the status of the applicant as Dental student by his Dean and statement he desires to enlist in Reserve Corps of Medical Department. Dental students in camp should proceed same as above except need not furnish Form One Hundred Three. Address request to Surgeon General, Washington, D. C., attention Major Logan. Letter of detailed instructions mailed as soon as possible. Statement from Major Logan.

"(Signed) GORGAS."

"The above is copy of telegram sent you October 8th. To obviate correspondence, I desire to inform you that Form 103 is in possession of such dental students as will have need for it, in connection with their enlistment in the Enlisted Reserve Corps of the Medical Department.

"W. H. G. LOGAN,
"Major, M. R. C."

What shall we say of this recent legislation? Not simply that the dental profession may hold its head a bit higher than before, but that the members thereof must consecrate themselves to a more exalted conception of their obligation to science, to the community in which they live, and to the Government. Dentistry will never be quite the same as it has been—it will be better, it will be more efficient. But it will not enter fully into the inheritance which Congress has passed to it, unless every practitioner is willing to sacrifice something of his own interests, and work whole-heartedly for whatever measure may come up for the public weal.

THE EDITOR'S DESK.

A friend of mine has just handed me a poem, and I want my readers to share it with me. It is one of the best and truest things I have ever read. I do not know in what publication it appeared or I would gladly give credit for it. The poem is merely signed "B. Braley." I do not know who B. Braley is, and I am ashamed to acknowledge it. I feel that my education has been neglected when I have never heard of a man who can write like that. It is truth boiled down, it is truth in a nut-shell, it is truth in chunks. Every boy should have this poem pinned in his hat where it would constantly seep into his brain. That poem was an inspiration, and if the author never writes anything else, he has made himself immortal. Here is the poem:

OPPORTUNITY.

With doubt and dismay you are smitten,
You think there's no chance for you, son?
Why, the best books haven't been written,
The best race hasn't been run;
The best score hasn't been made yet,
The best song hasn't been sung;
The best tune hasn't been played yet,
Cheer up, for the world is young!

No chance? Why, the world is just eager!
For things that you ought to create;
Its store of true wealth is still meager,
Its needs are incessant and great;
It yearns for more power and beauty,
More laughter and love and romance;
More loyalty, labor and duty;
No chance—why there's nothing but chance!

For the best verse hasn't been rhymed yet,
The best house hasn't been planned;
The highest peak hasn't been climbed yet,
The mightiest rivers aren't spanned.
Don't worry and fret, faint hearted,
The chances have just begun.
For the best jobs haven't been started,
The best work hasn't been done.—*B. Braley.*

BOOK REVIEWS.

A Manual of Dental Prosthesis. By George Henry Wilson, D. D. S. Professor of Prosthesis and Metallurgy in the Dental Department of Western Reserve University, Cleveland, Ohio; Special Professor of Prosthesis in the Dental Department of the University of Southern California, Los Angeles, Cal. Third and Revised Edition. Illustrated with 439 engravings. 568 pages. Price, $4.50. Published by Lea & Febiger, Philadelphia and New York.

Whenever Dr. Wilson writes on Dental Prosthesis the product is well worth reading. In this third edition of his book he has brought the subject strictly to date. Special investigations have been made in plaster of paris to determine its physical properties and the principles underlying its use. He has also further elaborated the subject of "Anatomical Antagonization," he calls it, and has treated on the theories of Dr. Gysi, Dr. Rupert E. Hall and others. He has also given close attention to the best methods of taking a good impression, and of making models therefrom. In fact every subject properly belonging to Dental Prosthesis is considered in detail, and at the same time in the fewest possible words. The book is worthy of all praise, and it is no wonder that it has gone so soon into a third edition. We congratulate the author, and also the publishers, and we advise the profession to buy the book.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to The Dental Review, 810 Masonic Temple, Chicago, Ill.

Feather Edges on Gold Inlays:—To avoid "feather edges" on cast gold inlays at the gingival border insert sprue in wax pattern on the occlusal surface—*never* on the contact point or proximal surface.—*Victor H. Fuqua, Chicago.*

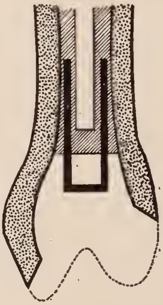
A Help to Avoid Bubbles in Inserting Compound:—After measuring portion of water pour the compound in and shake around until it all settles in the water. Then with just a little stirring it will be free from bubbles.—*H. Reid Staley, Harvey, Ill.*

Wax Models for Dummies:—After carving to form the wax should be trimmed free of contacts with abutments. This greatly facilitates the adjustment of finished casts to the model, and allows space necessary for soldering.—*N. R. Smeltzer, Chicago.*

To Lessen Pain:—After an extraction, where bone has been removed by burs or chisels, or where alveolar process is exposed; dry the surface and apply 95 per cent phenol, then neutralize with alcohol. This will lessen the post operative pain.—*R. E. Light, Chicago.*

To Remedy Sluggish Cuspidor Discharge-Pipe:—Disconnect supply hose at cuspidor and thrust down waste opening in bottom of bowl, first removing trap. Turn on supply water and often force of the same will correct partially clogged outlet.—*J. F. F. Waltz, Decatur, Ill.*

Excel in One Thing:— You do some one thing better than you do any other thing. Pursue that thing, improve in it, make a hobby of it. No telling what it may mean to you. If you are known to excel in some thing, your deficiencies are minimized in the light of that fact.—*J. F. Nelson, Chicago.*



Split Proof Bicuspid with Porcelain or Gold Inlay:—Cement an irridio-platinum staple in the roots of the first bicuspid, leaving as much as half protruding from the cement in the canals to where the sulci will be, and cover it with gutta-percha. Make your inlay, either direct or indirect method, and the hole in it will retain it on the staple, after having removed the gutta-percha.—*Homer Almon.*

Banding Broken Down Teeth:—In doing a pulp canal operation on a badly broken down molar or bicuspid select an aluminum band such as we can get from the Blue Island Company. Have the band slightly larger than the tooth circumference, dry tooth surface thoroughly, slip trimmed band to place and pack base plate Gutta Percha between tooth and band. These bands will at times stand the pressure of a rubber dam clamp, but in the majority of cases we place the clamp on the tooth distal to the one we are operating on.—*Elmer S. Best, Minneapolis, Minn.*

Study Details:—Dentistry is filled with small imperfections. If we will all begin to eliminate them, one at a time, we shall quickly observe a vast improvement. For instance, if you are not perfectly satisfied with the contour and occlusal surfaces of the crowns you are making, take a perfect tooth and study it as you make your crown, and you will observe a big improvement at once. If your inlays are not satisfactory, find out why, and take steps to get rid of the cause. Dr. Peeso's new book will give you much valuable information in this connection.—*O. deF. Davis, Minneapolis, Minn.*

A Hint About Dental Root Canals:—It is very essential that the denist should have clearly in mind the number of root canals that are to be found in each and every tooth in the human mouth, else he would be illy prepared to successfully treat a tooth that comes under his care. While there are exceptions to the rule in some of the teeth the following table will be found to be correct in nearly all cases:

All incisiors and cuspids, both in the upper and lower set, have but one canal each.

The upper first bicuspids *always* have two canals each.

The upper second bicuspids, in nearly all cases, have but one canal but occasionally two canals are found.

The upper first and second molars have three canals in nearly all cases.

(Note.—The writer recently had occasion to extract an upper second and third molar, each of which had but one root. Both were extracted from the upper left side of the mouth leaving the first molar in situ.)

The third molars, both upper and lower, are so varying as to the number of canals in each that no rule can be given regarding them. *All* lower bicuspids have but one canal each.

The lower first and second molars have three canals each, while there are but two roots to each, the mesial root has two canals and the distal root but one canal. The writer has met with a few cases in which the distal root had two canals also, but such cases are very rare.—*H. A. Cross, Chicago.*

MEMORANDA

TEXAS STATE BOARD OF EXAMINERS.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board for the examination of applicants will be held at Iowa City, Ia., commencing Dec. 3rd, at 9:00 A. M. For further information address the secretary, Dr. J. A. West, 417 Utica Bldg., Des Moines, Iowa.

OHIO STATE DENTAL SOCIETY.

The fifty-first annual meeting of the Ohio State Dental Society will be held in the Hollenden Hotel, Cleveland, December 4, 5 and 6.

The program promises one of the greatest and best dental meetings ever held in this state; special attention will be given War Surgery, the management of vital teeth for supporting artificial substitutes, and to a complete review of all phases of non-vital teeth; the latter to be covered by a series of twelve ten-minute discussions, further exemplified by progressive clinics. Tuesday forenoon and Thursday afternoon will be Exhibitors' Sessions, to which especial attention is called. Come for the first day's program and bring note book and pencil. F. R. Chapman, secretary; 305 Schultz building, Columbus, O.

COLORADO STATE BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of the State of Colorado, will meet in Denver, Colorado, Tuesday, December 4th, 1917, at 8 a. m., for examination of applicants for license to practice dentistry in the State of Colorado. In addition to the written examinations, applicants must supply their own patients, instruments and materials, and come prepared to do practical work under the supervision of the Board. All applications must be in the hands of the Secretary not later than December 1st. For application blanks and information, address, R. C. Quick, Secretary; 310 Metropolitan building, Denver, Colorado.

THE
DENTAL REVIEW.
Vol. XXXI. CHICAGO, DECEMBER, 1917 No. 12

THE DIAGNOSIS AND TREATMENT OF DESTRUCTIVE DISEASES OF THE DENTAL PULP; AND A METHOD OF REMOVING THE DEAD TISSUE FROM THE CANALS.*

BY J. P. BUCKLEY, PH. G. D. D. S., CHICAGO.

It is often a difficult problem for the conscientious operator to decide upon a method of procedure that will best conserve the interest of the patient. Especially is this true when we are trying to determine whether a diseased pulp should be treated and saved or whether it would be best for all concerned to destroy and remove it. It is so easy in most cases to anesthetize or devitalize the pulp that many dentists resort to this method of treatment in nearly all of the diseases of the organ. When we consider the fine and tortuous canals which we so frequently encounter and the difficulty both of removing the dead tissue from such canals and of thoroughly filling them subsequently, it is a question whether or not the best interest of the patient is conserved by adopting this method as the general practice.

While it is true, generally speaking, that pulps which are diseased beyond the condition of active hyperemia should be removed, it is also true that this organ has been destroyed far too ruthlessly in the past. The work of Rosenow, the observations of Hunter, Murphy, Billings, the Mayos, Crile, and others of the medical profession, and the investigations of Grieve, Rhein, Gilmer, Price, Hartzell, Logan, Moorehead, Black, and others of our own profession, along the line of periapical infections and the systematic results, should teach us to conserve the dental pulp in every case where it is practicable and consistent with good dentistry. Thousands upon thousands of normal pulps have been sacrificed for no other reason than that the dentin of the tooth was hypersensitive. When we think of the difficulty—not to mention the carelessness—under which these pulps are often removed, and of the frequent periapical infection resulting therefrom, we behold a sad spectacle, indeed! Such results should teach us that this practice must cease.

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*Read before the Chicago Dental Society, October 16, 1917.

I have never heretofore, nor do I intend to now, to plead for the life of the pulp when the reading of the clinical symptoms clearly indicates its removal; but I do mean to say that in all cases an effort should be made to determine as nearly as possible the exact pathological condition, and our decision should be based upon these findings. From the viewpoint of the diagnostician there are few subjects of greater importance than those of hyperemia and inflammation of the dental pulp. In the treatment of the dental pulp, as in all other therapy, it is highly essential that we differentiate between the various kinds of diseases of this organ, and by means of reasoning, using common sense and judgment, and the process of exclusion, arrive at a correct diagnosis before applying out therapeutics.

The Normal Dental Pulp.—To know a tissue or organ in disease one must first know it in health. Therefore, let us briefly review the anatomy and physiology of the dental pulp. Our histologists inform us that this organ is the remains of the original dental papilla, changed somewhat to meet its present environment, and is composed of soft embryonal connective tissue with an outer layer of odontoblastic cells, the whole being well supplied with blood-vessels and nerves. The blood-vessels of the pulp are supposed to communicate with the general circulation through the apical foramen or foramina of the tooth. One or more small arterial trunks enter the pulp cavity at the apex, and, coursing occlusally through the center of the tissue, give off many branches. Near the occlusal end of the pulp they further divide into capillaries, and form a fine plexus around the periphereal portion of the pulp. The blood-vessels are generously distributed through the tissue. The veins form a similar plexus, and a central vein, analogous to the artery, receives the blood from these many venules and conducts it through the apical foramen. The nerves of the pulp are transmitted through the apical foramen together with the blood-vessels. Several bundles of medullated nerve fibers enter the foramen and break up into a plexus of nerves, which are widely distributed through the pulp tissue. (Turner.)

Character of Blood-Vessels.—The walls of the pulpal blood-vessel are unusually thin. The arteries are found to be almost devoid of the external fibrous coat; and, according to Noyes, the muscular layer is represented by a single involuntary fiber, while the walls of the veins are formed by a single layer of endothelial cells. It has long been known that the pulp tissue, like the brain, contains no lymphatics, and when we recall the thinness of the walls of the blood-vessels and that organ is confined within a cavity having unyielding walls, the absence of lymphatics becomes of the greatest pathologic significance.[1]

Diagnosis of Active and Passive Hyperemia, and True Pulpitis.—In the pulp tissue, as in all living tissues of the body, we may have two kinds of hyperemia—active, or arterial, and passive, or venous. The former is defined as an excessive amount of blood in the arteries and the latter as an excessive amount of blood in the veins. Active hyperemia is due to a determination of blood to a given part as the result of reaction to an irritant, and as long as it remains without an excessive immigration of the white blood corpuscles, it is active, or arterial hyperemia. The cause of passive hyperemia is different. Here the blood may be held back by some obstruction in the veins which prevents the return of blood to the heart. Inglis says: "The backing up of the blood following venous obstruction produces tension upon the vessels followed by diapedesis of red corpuscles and exudation of watery fluid—the condition of edema. In inflammation arterial hyperemia appears as the first stage, followed by a collection of leucocytes along the walls of the small veins, and the immigration of some into the perivascular tissue. As this eventually leads to stoppage of the blood current, and even to stasis, the condition is essentially a venous hyperemia. Accompanying the immigration of leucocytes is an exudation of lymph, highly coagulable in character, which distends the lymph spaces in the tissue and produces the characteristic swelling."

The thing of special interest here is that in inflammation or even in venous hyperemia certain blood elements escape through the temporarily dilated vessels into the perivascular tissue, which becomes coagulated, and when the tissue involved is the dental pulp, which, as we have learned is without lymphatics, this coagulation of the fluid elements of the blood means death. The procedure of many practitioners when an aching tooth presents involving the pulp is simply to find out whether the latter is dead or alive. If alive, cocain hydrochlorid or arsenic trioxid is generally applied, or else the tooth is treated tentatively by placing cotton dipped in oil of cloves, or some other soothing remedy in the cavity, and the patient is dismissed without making any effort to ascertain the condition of the pulp—whether it is in the stage of active hyperemia or passive hyperemia or true inflammation. If, on the other hand, the pulp is found to be dead, the tooth is too frequently treated by opening up the pulp chamber and placing therein a pledget of cotton dipped into the most convenient remedy at hand, leaving the cavity unsealed for fear of causing septic pericemenitis or an acute alveolar abscess, and making no further effort to ascertain whether the pulp has been infected by pyogenic microorganisms, producing pus on the exposed surface or, as sometimes occurs, within the substance of the tissue, or whether the germs inaugurating the changes are of the saprophitic variety causing pulp decomposition with gaseous end-products. It is highly essential, therefore, when a patient presents with an aching tooth, that we take the time and trouble to determine not only whether we have a live or a dead pulp with which to contend, but, if the pulp is alive, whether the condition is one of active hyperemia only or passive hyperemia or inflammation; or, if the pulp is dead, whether the condition is a so-called septic pulp with pus formation (pulpal abscess) or one of true gangrene with gaseous end-products. To confirm our diagnosis the tooth should be isolated and kept dry, preferably with the rubber dam, and a careful examination made. On no other basis can rational therapeutics be practiced.

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[1] Noyes has recently been led to believe from investigation that lymphatics are present in the pulp tissue.

Differential Diagnosis.—It is generally a simple matter, by asking a few questions and observing conditions, to differentiate between the pathologic condition of a vital pulp sufficiently to determine whether the organ had better be saved or destroyed. In acute active hyperemia the pain occurs only when the irritant is applied, and subsides almost momentarily without treatment. Logan states that "active hyperemia exists in a pulp when the pain begins with a known irritation, lasting only a few moments, or minutes at the most, and subsiding without treatment and not starting again until the application of another known irritant is made." Such irritants may be heat, cold, impaction of food, etc.

Treatment of Active Hyperemia.—The treatment of this condition consists in protecting the tooth from the irritant which caused the disease. If a cavity exists which is causing the trouble an anodyne remedy is indicated. One treatment with phenol compound, or other remedies possessing similar properties, should cure a case of active hyperemia due to caries of the tooth. At the second sitting, if the case has a favorable history, the rubber dam should be adjusted and the dressing and carious dentin removed, after which a base of cement may be inserted, the cavity prepared, and the tooth filled. In those cases where the cavity is deep and encroaches upon the pulp, and where the removal of the softened dentin practically exposes the organ, it is necessary, in order to save the pulp, to protect it by the use of some antiseptic paste. Here I use thymolized calcium phosphate as the power and oil of cloves as the liquid to make such a paste. Just a little aristol or europhen (iodin compounds) is added to the paste after it is mixed to the proper consistency, which should be like softened gelatin. In cases of actual exposure, the pulp should be destroyed and removed, unless some exceptional reason obtains for preserving the life and functuating powers of the organ; and even in cases of near exposure, one must be careful that the pulp is acutely alive and normal, for in many cases it simply dies without the manifestation of the usual pathologic symptoms. Such stimuli as heat, cold and electricity may be used to test the acuteness of the vitality of the pulp. Should it fail to respond to these tests, or should it ache severely without ceasing momentarily, it had better be removed.

Treatment of Passive Hyperemia and True Inflammation.—As far as therapeutics is concerned, it is of little importance to know whether the pathologic condition of the pulp is passive hyperemia or true inflammation. In either case we have transudation of the fluid elements of the blood and diapedesis of the red corpuscles occurring, and this means death ultimately. In passive hyperemia the pain is more constant than in active hyperemia, and may start without the application of a known irritant. In inflammation the pain is continuous and of a boring character, or it may be lancinating, and is frequently described by the patient as a "jumping toothache." When the reading of the symptoms indicates either of these conditions, our therapeutics differs from that prescribed for active hyperemia, for here, as has been previously stated, the pulp must be destroyed.

The method of destroying the vitality of the dental pulp will not be considered in this paper. It makes no difference to me how the pulp is destroyed as long as the results are satisfactory. In my own practice I use both pressure anesthesia and devitalization. In cases of pressure anesthesia, where I know in advance that this operation is to be performed, I generally make one application of Desensitizing Paste which permits my reaching the organ without pain in those cases where there is a cavity and of making a depression or cavity painlessly in those cases where no cavity exists. In this manner the desired end is accomplished with very little pressure and the least pressure used the better the results will be. I also desire to state that in many cases I still use arsenic trioxid.

Action of Arsenic Trioxid.—At the present time there is considerable discussion in dental literature as to whether or not the effects of arsenic trioxid when applied to a dental pulp are self-limiting. Some men of high standing in the profession are of the opinion that the drug is too destructive an agent to be used for the purpose of pulp devitalization. It seems to the author that these opinions are not well founded when we consider the long clinical record of the drug as a devitalizing agent. It has been used since 1836. There can be no question regarding the harmful effects of the drug when injudiciously employed. Its action is not self-limiting. Its effects are produced only after the drug is absorbed by the tissue elements, altering or destroying their vital processes in an obscure manner. The reason why the drug may be safely employed in devitalizing the pulp of a fully erupted tooth lies in the fact that here the effects are confined to the pulp tissue, since the organ dies by strangulation at the apex, due to the congestion caused by the drug when so used. Thrombosis and death of the pulp takes place and, owing to the small formina of the tooth-root, absorption of the drug by continuity of tissue is prevented. In those cases where the apices of the roots are not fully formed, the drug, if used at all, should be left sealed in the tooth only a short time.

Diagnosis of Dead Pulps.—It is not a difficult matter, as a rule, to differentiate between the teeth containing living or dead pulps. The clinical history, the color of the tooth, its response or non-response to thermal or electrical stimuli, will lead us to suspect that the pulp is dead or alive. Now we are ready to confirm our diagnosis. One of the best means of confirming the diagnosis of a dead pulp is the use of electricity by an instrument known as the "vibrating coil." This consists of a dry cell and a vibrating coil with a switch to control the current. The cord leading from the positive pole is arranged with a holder so that a broach may be attached; cotton is wrapped around the broach and moistened when it is applied to the suspected tooth. The cord from the negative pole is attached to a metal holder, which is held by the hand of the patient; thus the circuit is completed. A stronger current may be had by moving the positive pole to the right on the instrument board or by gradually withdrawing the cylinder which runs through the coil. One should always start with a weak current, gradually increasing the strength if no response is obtained. It is best to apply the current first to a tooth known to be vital, and use this as a control or guide. When two appoximating teeth contain metal fillings, the current should be applied to the tooth so as not to come in contact with the filling of the adjoining tooth, which, if vital, would respond, leading one to believe that the tooth to which the current is applied is vital, when, as a matter of fact, it may be pulpless.

After the diagnosis of a dead pulp has been confirmed, the pulp chamber should be freely opened with a suitable round or special pulp chamber bur. It is not enough here to simply determine whether the pulp is dead or alive; but, if dead, an effort should be made to determine whether the condition is one of true gangrene with its characteristic odoriferous and gaseous end-products or whether, as sometimes occurs, the active pyogenic microorganisms have liquefied a part or all of the bulbous portion of the pulp, forming drops of pus in the pulp chamber with practically no odor, and with the tissue in the canals still vital.

Treatment of Pulpless Teeth.—When a patient presents with a pulpless tooth, the original pulp tissue is generally either in a moist gangrenous condition, as a result of the action of bacteria, or a previous attempt has been made to remove the pulp and fill the canals. In either case, the first treatment here, in my opinion, should be a dressing of formocresol. Other preparations may be just as effective; but this is the one I have used for years and about which I can speak with assurance. Under aseptic precautions, this remedy should be placed in the pulp chamber only, and the dressing retained with cement. This dressing should remain at least twenty-four hours, and in the interim a radiograph of the tooth and periapical area should be obtained. I know that many good men to-day advocate the immediate cleansing of a gangrenous canal; but I am firmly of the belief that the safest and best practice is to first apply at least one dressing of formocresol. Gilmer, Moody, and others have found that the predominating organism in the conditions resulting from a gangrenous pulp, therefore the group active in bringing about the decomposition, is a streptococcus.

One initial treatment of formocresol in these cases, while it may not kill all the organisms present, will certainly lessen the number and lower the virulency of those remaining. Surely no one will deny the favorable and valuable effects of formaldehyd gas on the intermediate and end-products of pulp decomposition. With these poisonous and irritating products chemically neutralized; with the bacteria, inaugurating the process, killed or their virulency lowered, we may the more safely, I believe, work to the root-end, clean and enlarge the canal by a chemico-mechanical process. By this I mean the use of chemicals in connection with broaches, reamers, files, and other necessary instruments. At the present time, so far as I know, there are three chemical agents in general use for this purpose—metallic potassium and sodium, as advocated by Rhein; sulphuric acid by Callahan; and phenolsulphonic acid by myself. In this paper I shall only consider the use of acids.

Advantages of Phenolsulphonic Acid.—The chemical action of sulphuric and phenolsulphonic acids for the use under consideration is practically the same; and they will be discussed here conjointly. Personally, I prefer phenolsulphonic acid. Its consistency is thick and syrupy in the 80 percent. strength which is recommended; thus a drop will adhere to the end of a broach or other applicator, permitting it to be carried even into the canals of upper teeth without difficulty. The acid does not materially effect a broach, and if any of it accidentally gets on the enamel of the crown of the tooth and is not noticed for a time, it does not decalcify and whiten the spot to the extent that sulphuric acid would do. It might be supposed by those who have not used phenolsulphonic acid that, possessing the above-mentioned advantages over plain sulphuric acid, it would be less effective in the canal. I have not found this to be the case. The agent has one possible disadvantage. In using either of these acids, after they have been introduced into the canal for a time and the walls thereof filed with a suitable broach, they should be neutralized with a solution of sodium bicarbonate. In the case of sulphuric acid the salt formed as a result of the reaction is sodium sulphate, a freely soluble salt. With phenolsulphonic acid the salt formed is sodium phenolsulphonate, which is not as soluble as sodium sulphate. I can conceive how it might be possible in a very fine canal to temporarily block it with the salt formed. An excess of water would readily dissolve the salt or by using a solution of sodium bicarbonate of not more than 10 per cent. strength the salt would be dissolved as soon as formed by the reaction. This is a thing which probably would never occur in practice; but I mention it as a possible disadvantage.

Pulp Partially Alive.—In those cases where the pulp tissue is gangrenous in one or more canals of a multirooted tooth and alive in the other one or two canals, as the case may be, we will find much satisfaction in using the formocresol remedy. These are exceptional cases and it is difficult to know whether this condition exists until the second sitting. If there be much vitality in the live pulp tissue, the formaldehyd in the remedy will doubtless make the tooth ache, but after we know the condition our method of procedure is simple, and the results will be certain. A small pledget of cotton dipped in the remedy can gently be placed over the mouths of the canals which contain gangrenous material, and a thin quick setting cement flowed over the cotton. After the cement has set, the live pulp may generally be desensitized and removed with very little pain by gently working phenolsulphonic acid up or down the canal with a fine broach. Formerly these were difficult cases to treat, but with a remedy which can be hermetically sealed in a gangrenous canal, the procedure is materially simplified.

Pulpal Abscess.—It was previously mentioned that one may occasionally open into a suspected tooth, having all the symptoms of a dead pulp, and find a drop of pus in the bulbous portion of the pulp chamber with the remaining portion still alive. Some writers call this condition a septic pulp or pulpal abscess in contradistinction to gangrene or true putrescence (presence of gases). In such a case, any remedy containing formaldehyd may cause the tooth to ache; therefore, this must be taken into consideration, and in the treatment of so-called septic pulps, the pus should be washed out of the cavity with a warm antiseptic solution, the cavity dried, and asepsis established by hermetically sealing in a much smaller amount of the formocresol than that generally used in cases of true gangrene. If this precaution is taken the tooth will not ache long, even in cases where no odor is present and the vital tissue is still quite sensitive. This remedy will sterilize the tissue, after which, at the second sitting, the pulp can be anesthetized or devitalized as usual.

Removing Old Root-Filling.—In those cases where a previous attempt had been made to fill the canal with gutta-percha, it is necessary, after the initial formocresol treatment, to first remove the old root-filling. Generally in these cases there is only one cone in each canal, in which event the acid will soon work its way around the cone when it may be loosened with a suitable instrument and removed in one piece. However, occasionally it becomes necessary to remove a filling where the gutta-percha has been firmly placed in the canal.

Here the use of xylol, or xylene, as it is also called, will aid materially in disintegrating the gutta-percha. This is dimethylbenzene, and while the agent does not dissolve the gutta-percha in the sense that chloroform would, it readily attacks and disintegrates the material, making its removal, after a few minutes, comparatively easy.

Removing Blockade in Canal.—We should never use any drug or chemical blindly. Therefore, if in working up or down a canal, we find it blocked and are unable to reach the end, instead of going on blindly using only one chemical, whatever it may be, and running the risk of making a false pocket, we should stop and ascertain, if possible, and it is generally possible, the nature and character of the material causing the blockade. It may be a remnant of an old gutta-percha cone; it may be pulp tissue undecomposed which has been inadvertently packed in the canal; it may be some inorganic material, such as a pulp nodule, secondary dentin, or other loosened inorganic material which has been pushed into the canal. If we have reasons for concluding that an old gutta-percha filling is causing the blockade, xylol is the chemical to use; if we think it is organic material, the alkalies, like potassium and sodium or a strong solution of one of the hydroxids of these metals, is indicated; if inorganic material, sulphuric acid or phenolsulphonic acid will best answer our purpose.

Whenever we find these blockades, as we so frequently do where the canals have been treated before, and when we select and use the proper chemical and with a twist broach we slowly, and carefully, but nevertheless surely, twist our way to the end of the root; and then when we fully appreciate that we are actually to the end—in the language of Briggs, the Cartoonist, "Oh! ain't that a grand and glorious feelin'?"

It is well understood, I trust, that all this work should be done under as nearly aseptic conditions as can be done in the modern dental office; and, in closing, I will say that no dental office is complete to-day without practical means of sterilizing all instruments and materials used by the four methods of dental sterilization, viz., direct flame, moist heat, dry heat, and chemical agents. The responsibility of having all instruments and materials used in dental surgery sterile, where it is possible to cause an infection through an open wound or otherwise, is rightfully thrown upon the dentist; and in assuming this responsibility he should study carefully the various methods of sterilization, and exercise judgment in his application of the principles employed; then when it is necessary to remove a pulp from whatever cause, it may be done without fear and trembling; and without following the highly questionable dictum that all pulpless teeth had better be extracted. In doing this work my advice is to continue to do your best, which, it must be admitted, is very good.

DUTIES OF THE ASSISTANT.*

BY DR. EDWARD S. BARBER, D. D. S., CHICAGO, ILL.

In my travels about the country I notice an increasing demand for the services of trained dental assistants and it seems that the demand far exceeds the supply. Many dentists have learned that with the services of a competent assistant it is possible to greatly increase their earning capacity with less worry and labor to themselves. This position is open to the young woman of average intelligence and willingness to learn. As in many other positions the failure in attaining a high degree of proficiency is more often caused by indolence and lack of interest than incompetence.

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* Read before the Wisconsin State Dental Society July, 1917.

A girl who accepts the position as assistant merely to be away from home or to earn "pin-Money" will not meet with the same success, or in turn be eligible for the same salary, as the girl who follows this as a means of earning a livelihood. With the latter it is a business proposition. She is interested in holding her position and makes use of every opportunity to increase her efficiency. Making herself a necessity in the office is the one sure way of succeeding.

An assistant should realize that her employer is paying for her time and that it belongs to him during working hours. His office is no place for her to receive callers or entertain her friends, and the telephone is not put there for her personal use.

At the present time, with a few exceptions in the larger cities, it is nearly always necessary to employ an inexperienced girl and train her for the duties of a dental assistant. Hundreds of dentists have expressed to me their wishes that the schools give some course devoted to the training of assistants, stating that they could afford to pay good salaries to those able to do the work.

In training the assistant the fact should be taken into account that it required three years of our time to secure our dental education and probably most of us were somewhat familiar with the instruments and various mechanical tools before entering college.

The average woman has had little or no experience in the use of mechanical appliances of any description and it is hardly fair to expect the inexperienced girl, no matter how thorough her education may have been, to learn all about a dental office in a few week's time. Many dentists start out bravely enough to teach the assistant but as soon as she gets far enough along to know where a few of the appliances are kept they get too busy to teach her any more and expect her to learn the rest by intuition. In consequence of this most dental assistants are of little use because they are insufficiently trained. Wherever a dentist has taken the trouble and spent the time necessary to properly instruct an intelligent young lady in the duties of his office he has found her services invaluable in maintaining the equilibrium of his practice.

For the first few days the assistant should be told to simply stand about and watch and see how patients are handled and how dental operations are conducted, without asking her to take part by actively assisting at the chair. In this way she gets a general outline of her duties and then should be taught how to keep the office clean and should be told to keep on the lookout for dirt and always be able to see it before the patient appears to and remove it.

There is so much work to do about an office that the assistant should never be idle. The appearance of being busy gives patients the idea of a prosperous office, while the assistant who has time to read novels and chew gum during office hours usually has time to do little else. A dirty, disorderly office is a direct reflection on the ability and efficiency of the assistant.

She should be told to meet the new patients as pleasantly as she would her best friends in her own home, and the dentist should listen to her conversation with his patients both about the office and over the telephone to see that she gives them the information desired and treats them in a courteous and dignified manner.

Provided he is not satisfied with what he hears he should delay instruction till the departure of the patient and then tell her "this is what you should have said."

To save time in answering the telephone the best salutation when she takes down the receiver is, "This is Dr. Blank's office," and wait for information from the other party. This should be written down as fast as received, so that there can be no mistake. She should, if possible, get the name, telephone number and address of the party calling before giving out any information. In this manner the dentist has a complete record of persons who call up during his absence, or when too busy to answer the 'phone, and he is able to locate them later; whereas if the assistant simply made a statement that he was out at the time, the prospective patient might not take the trouble to call again. This little point has added hundreds of dollars to the income of my own office.

The blank illustrated in Fig. 1 is one I have used for a long time in my practice and on this the young lady assistant fills out all the information secured over the telephone or after seating the new patient in the reception room. These blanks are put up in tablet form of 4 x 6 inch size, which is the exact size of the cards we use in our card systems, and the information received is often attached to the patient's card for permanent reference.

By the use of this card the competent assistant can usually separate the wheat from the chaff, making it unnecessary to see any of those people who make a business of wasting the time of so many dentists.

It is her duty to get all information and to act as a go-between and not permit any person to take the time of the operator unless the errand directly concerns the business of the office.

In case the information received is something that we must attend to personally, she writes down as well as she can, the exact facts and brings the card into the operating room, holding it behind the patient's head in such a manner that we can see the message without the patient in the chair having any knowledge of it. A few words of suggestion will indicate whether the new patient is to wait or, how he is to be otherwise disposed of, without interfering in any way with the operation at the chair.

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Mr. ....

Address ....

Telephone ....

Nature of Business....................................

Referred by ....

Desires Appointment at...........................M................

Remarks: ....

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Fig. 1.

A dentist's time is too valuable to answer the telephone or, to meet people at his reception room door. Besides, it lessens the dignity of his office should he take time to do so. The average person takes very kindly to having these duties performed by a trained assistant, and in most instances where there is any objection to this procedure I find that with a person so unreasonable it is best to eliminate that patient at the start.

An assistant is most necessary with the use of the anesthetic. If she has been carefully and gradually trained in its use, a sudden emergency should not throw her off her guard. Knowledge gives courage, and skill is attained by practice. She should read the dental journals and pay particular attention to the articles on anesthetics in the medical journals. Her employer should also procure for her the various text books on anesthetics and she should give them close study and any point about the practice which is not understood she should make a note of and have her employer explain thoroughly at the first opportunity. The assistant should never be allowed to ask questions during the course of an operation, as this often disturbs the patient and causes unnecessary fear and worry.

She should read carefully, each month, some good journal of nursing and her employer should supply without charge all of these books and periodicals and assist her to an understanding of their contents.

In direct connection with the duties of the dental assistant the following extract from the *American Journal of Nursing* is interesting:

"Briefly stated, the idea of a trained dental assistant comes about through the effort on the part of the dental profession to do prophylactic as well as repair work. Statistics show that there are only about 40,000 dentists in the United States and that it is impossible for this number to keep the teeth of the people properly cleaned in a way that will prevent decay. One dental college has included in its curriculum a course for the training of dental assistants for the purpose of enabling them to do cleaning and polishing of the teeth and some of the minor procedures of dentistry. In the official outline of the course no educational qualifications are called for. It would seem that any woman might enter this course and, provided she passed the necessary examinations at its close, be considered qualified. The matter of the preparation of such women has been discussed in large dental conventions, and while the idea has been brought out that trained nurses with this additional training would make the most valuable assistants, so far as we have been able to learn, their employment for that purpose has not been considered altogether practicable. The idea was advanced in one of these discussions that nurses would be willing to do this work for about $15.00 a week, as the service being continuous, the annual income would about equal what a nurse receives during a year for irregular cases.

PROPHYLACTIC ASSISTANT

"One of the things that has brought the matter to a climax is that in connection with dental clinics in public schools, the necessity of a dental assistant who can clean the teeth of school children has been felt. This is a simple process which any intelligent person can easily learn to perform, requiring for ordinary cases an orange stick of proper shape and powdered pumice, and would hardly seem to us necessary for a successful nurse to spend the time and money for taking such a course to receive at the end such small financial returns.

"While we do not pretend to speak with any authority on the subject of the plan for creating a class of dental assistants, there would seem to us to be no more reason why they should be required to be registered under the medical laws, who are giving anesthetics, vaccinating patients in doctors' offices and, as is reported in a news item of this magazine, performing the operation of skin grafting, all of which, are, strictly speaking, medical procedures and are being done under the direction of physicians."

The position of dentists' assistant is a field of work for which the graduate nurse is especially qualified. The dentist needs an assitsant with good training and knowledge sufficient not to usurp any part of the ordinary dental practice.

The graduate trained nurse has a splendid foundation for this work. She is superior by virtue of the very principles that are inculcated in her training to surmount the principal argument against the "trained dental nurse." She knows her limitations. Dentistry is as vital a subject as either medicine or surgery.

Choose the assistant with care. Try to hire brains rather than experience. The assistant with brains can be taught the proper and efficient way to become an ideal assistant. Many so-called experienced assistants have been wrongly trained from the start. They have gotten in a rut and it will take more instruction to teach them how to become thoroughly efficient than it will the inexperienced girl who is not hampered by a poor training.

In giving anesthetics the assistant should prepare the patient for the operation and in this regard can usually do more to quiet the nervous woman patient than the dentist himself. Besides she can do this while he is attending to an operation on someone else, thereby saving considerable time, which somebody must spend with the patient. Since her time is less valuable in dollars and cents than that of her employer, she should perform that duty.

She should give the anesthetic, manipulate the hand cuspidor, water syringe, compressed air and any other apparatus necessary to be used from the left side of the chair. This leaves the dentist's hands free to manipulate the cutting instruments, hand piece and mouth mirror. The assistant should wipe the patient's mouth out with sponges when required, keep the tongue out of the way, use the saliva ejector, and otherwise keep the mouth dry and the tooth cavity chilled with cold air so there will be no danger of overheating the pulp. Care should be taken to drive all debris and dust forward in order that it may not get down the throat and cause nausea.

She should wait on the woman patient after the operation, assisting her to prepare for the street and see that she is furnished with all the little toilet requisites which women desire.

She should make the patients feel that their comfort and pleasure is her one object and give each one her undivided interest and attention. There are numerous ways of rendering little personal services which mean so much to the patient and cause the assistant so little effort. Especially is this true of women patients. The assistant who expects to get far in this line of service will study the conditions that present themselves and by rendering a little more service than the dentist expects will make herself invaluable to the practice and be remunerated in proportion.

Probably the most impressive thing about an operating room is the amount of cleanliness displayed. This can nowhere be better illustrated than in the clothing of the operator and the assistant.

At all times the attire of the assistant should be that of a well groomed business woman. Necks cut decollete, the superfluous use of rouge and powder, extreme modes of arranging the hair, ill-kept hands, shoes run over at the heels, are all in very bad taste and absolutely abhorrent to people of culture and refinement.

The average woman is a good housekeeper and will object strongly to any dirt in evidence about the office. For this reason we use white uniforms and plenty of white linen everywhere. White shows the dirt and it is easy for the operator to see it before it is called to his attention by the patient. It is about time that some sort of uniform adapted to the peculiar needs of the dentist should be made use of and for this purpose we have

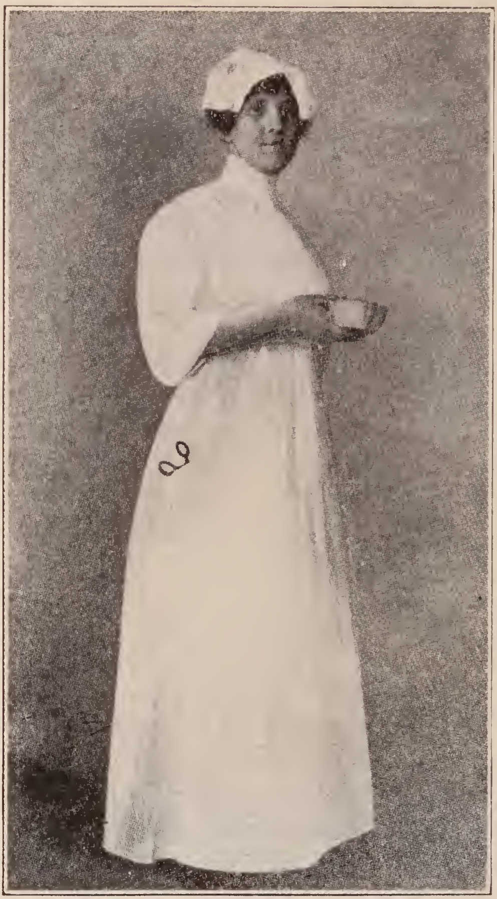

Fig. 2.
Dental Assistants' Operating Gown and Cap.

designed or adopted the different uniforms and linen protectors, illustrated in Figs. 2 and 3.

Canvas shoes with rubber soles have been adopted in many of the hospitals because one can walk about quietly and since they are well ventilated the feet do not become hot and blistered. Another reason for using them in a dental office, especially where the chair or controller is white, is that leather shoes will soon mar up these pieces of furniture, whereas the rubber soles will not. The assistants' uniform consists of white canvas shoes, a short sleeved operating gown and a head cap. The gown has two pockets in front for carrying sponges, necessary in operations under anesthetic work.

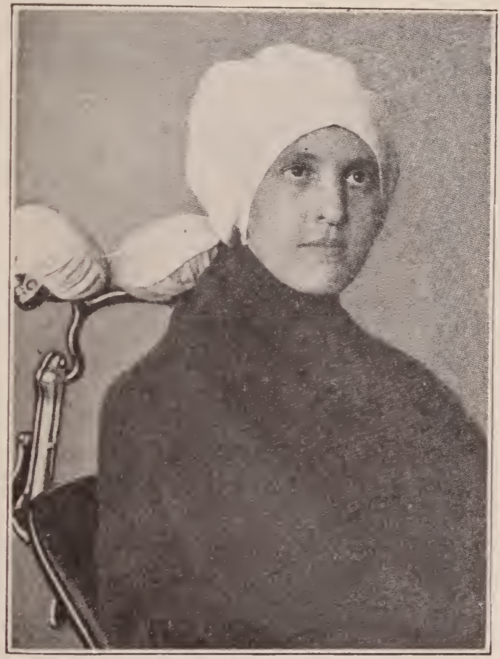

Fig. 3
Head Cap for Use of Women Patients.

In laundering these uniforms care should be taken to instruct the laundry man to do them up with water starch, which renders them soft and pliable.

There are two places about a chair that a woman patient will object to unless she is sure they are absolutely clean. One is the place where she places her hands and the other where she rests her head. To remove the first objection, metal arms should be used, which can be easily kept clean. The second can be taken care of by covering the head rest with white covers.

We use head caps for our lady patients. They not only keep the chair covers clean by preventing the hair coming in contact with them, but also prevent the patients' hair from becoming disarranged, which is something for which they will never forgive the operator. Most lady patients like these caps so much that they will insist on having them for each operation, after they have once been used. They are inexpensive and a sufficient quantity is kept on hand, so a freshly laundered one can be used for each patient.

Some sort of waterproof apron should be used on the patient. We used oiled silk, as this will stand boiling and aprons are thus treated, sterilized and scrubbed ocassionally and are known as the aseptol. I like them better than rubber because they are so much lighter, and patients often object to heavy covering in hot weather.

Under analgesia most patients perspire considerably and one of the places this is noticed first is in the palms of the hands. In order to prevent them from soiling the clothing we always place them on top of the silk apron and folded loosely in the lap so that the clothing will be protected. Another method is to fill the hands with absorbent cotton held in place with a bandage.

The patient under analgesia loses his sense of direction and is liable to expectorate on his clothing. If this happens the silk apron will protect him. This also is invaluable in the case of vomiting, because even with the best of care some of the vomitus is liable to come in contact with the clothing unless protected by the apron. Again, in operating for inlays and inlay bridge work it is quite common to use water to cool the grinding stones and very often this will be spilled on the patient's clothing, unless protected by the apron.

There is a growing tendency among physicians, nurses and dentists to use some sort of a red cross on their gowns and uniforms. This is in direct violation of a Federal statute. A few years ago the government began prosecutions against officials in several of the cities of the middle west for violation of this particular statute. I had my attorney look this act up and the following is his opinion:

The law referred to is an amendment to the "American Red Cross Act. It was passed June 23rd, 1910, and the section in which you are interested is as follows:

"It shall be unlawful for any person, corporation or association other than the American National Red Cross and its duly authorized employees and agents and the army and navy sanitary and hospital authorities of the United States, for the purpose of trade or, as an advertisement to induce the sale of any article whatsoever, or for any business or charitable purpose, to use within the territory of the United States of America and its exterior possessions any sign or insignia made or colored in imitation thereof, or of the words 'Red Cross,' or 'Geneva Cross,' or any combination of these words."

There is this important exception. If the person now using an emblem can show that he used same prior to January, 1905, for the same purpose for which it is now used, he is permitted to continue using same.

I called up the office of the United States District Attorney in Chicago and asked him whether they have construed the law to cover the use of the Red Cross by dentists and physicians in the manner in which it is now generally used. He told me that in the opinion of his office the use of same is forbidden by the act, except where it had been used before January, 1905.

You will note by the act that not only is the use of the cross on a white background forbidden, but any imitation of the same, either of the color design, is likewise prohibited.

I would suggest that some sort of monogram be used instead of the red or blue cross so often seen and thus escape possible annoyance.

The following are a few lines which I think it advisable to have a new assistant read over carefully and familiarize herself with.

Personal service is the big item in dentistry and it is largely furnished by the assistant and not by the dentist. Personal service is the thing that makes or breaks a big store, a big hotel, etc. It is not an easy thing to figure out for one's self, so I have planned a method for doing certain things in our office. We find it cheaper and better to teach them to the assistant than to allow her to use her own ideas entirely.

I always make it a plan in business to not only get all there is out of the business, but to assits those who are working with me to do the same. I believe that everybody in this world gets paid just what they are worth and the only way to get more is to be worth more; for the reason that I want each one of you to get more, I am going to tell you how to be worth more.

After telling you this, those of you who do not get more will look for other positions, meaning that you have not tried to carry out instructions. From time to time I want each of you to bring in suggestions along two lines. First, how to make the business produce better financial results. Second, how to save on the operating cost of the business. Each time one brings in an idea along either line, which I can use, I am going to give you a check for that idea, and the size will depend upon the importance of it. I want you to take these suggestions and study them over carefully and try to carry out what they mean, as well as what they say. Remembers that this is your business as well as mine and this business can afford and will pay as much for what you can do as any business anywhere.

I have a number of times had young lady assistants to whom I have paid $25.00 a week. At different times other men have offered them more and I advised them to take the raise, but that they never could come back. In one or two instances this has happened and the other dentists found themselves unable to pay the raise after three or four weeks, leaving the assistant without a position.

No. 1. Adopting a rule followed by all large business houses, no one is to use the telephone during office hours except on urgent necessity. This applies to incoming as well as to outgoing calls. The reason for this is because it does not look business-like and may interfere with incoming calls from our own patients. This procedure receives more unfavorable comment from business men regarding dental offices than perhaps any other.

No. 2. Do not have friends call to visit during office hours.

Have them call at the end of your specified day, except in cases where you simply wish to show them the office.

No. 3. The thing business men will pay you the most for is the use of your brains. Think before you act and be sure you are right. If you are not sure, **ASK.** The average dental assistant never gets above eight or ten dollars a week and in most cases six. The reason for this is they are doing scrubwomen's work and receiving a smaller fee for it than the average scrubwoman. The only dental assistants I know who are getting above $15.00 a week are girls who use their brains with their hands.

No. 4. There are two departments in this business. One is the dental practice and the other is the business end of it. All matters pertaining to the business end will be explained to the secretary and by her carried out. All matters pertaining to the dental end will be explained to the first assistant at the chair and by her explained to the others.

No. 5. Petty cash will be handled by the secretary, to be reported weekly as spent, and charged against her salary till accounted for satisfactorily.

No. 6. No materials shall be bought except on orders filled out and signed by me.

No. 7. All linens used must be counted in and counted out by whoever has charge of the storeroom.

No. 8. The storeroom attendant will be charged with the inventory of this room against her salary. This is to be checked weekly by the secretary and notice must be made of supplies running low and of all articles entered or taken out.

No. 9. The patient is to be met in the anteroom by the assistant in attendance. In case of a new patient full information should be secured and written on a card furnished for that purpose. (See Illus. No. 1.) In case of the regular patient the name will suffice. This is to be made out in duplicate, one copy to go to the operator and one to be brought to me. The regular patients shall be immediately taken into the reception room and their wraps attended to. The new visitor is to be seated in the anteroom until his business is determined and the door to the reception room closed.

No. 10. No messages shall be given to any operator verbally when a patient is in his room. Messages are to be written (and this applies to telephone messages also), and held behind the patient's head, for it is detrimental to our business to have patients know certain things connected with it.

The patient is the prime consideration. Everything must be dropped to give the patient instant service, for service is the thing they pay for.

No. 11. When the buzzer rings for the patient to depart, whoever has charge of that serice must see that the halls are lighted and meet the patient before they leave the chair, conduct them to the retiring room, if desired, and have their wraps for them immediately. Promptness in this matter may mean the difference between a pleased and dissatisfied patient. It may mean the loss or gain of hundreds of dollars to this office.

No. 12. When as many as three women tell me they do not like the mannerism of a certain girl, or the way in which she combs her hair, powders her face, or dressed herself, that girl will be looking for another job. When the same number of women tell me that they will quit coming here if a certain girl leaves me, that girl will get a raise in salary.

At the conclusion of this paper about one hundred slides were shown and explained, but space forbids their publication here.

THE WAR AND ITS EFFECT ON DENTISTRY.*

BY L. L. DAVIS, D. D. S., CHICAGO, ILL.

The dental profession of America is confronted just now by one of the greatest problems it has ever met, and only by careful study and prompt, effective measures will the proper solution be made. At no time in the history of the profession has its value in human economics been placed so high, and the recognition and demand for dental service so great, and this knowledge is spreading so that the dentists of the present age must practice along more scientific lines than ever before.

The wave of enlightenment regarding some of our former procedures has caused a material change in our methods of practice. We no longer destroy vital pulps to place abutments for bridges, no longer place the patient's teeth, and maybe life, in jeopardy to supply a substitute for a missing tooth. We take greater precaution in securing asepsis during the treatment and insertion of root fillings. We use our best efforts to secure proper adaptation and occlusion of all our measures for the repair of the ravages of caries. In fact today, even the ordinary dentist is taking precautions and practicing dentistry in a more enlightened manner. The best of the profession are striving for greater efforts. Post-graduate schools are better attended; special courses in special studies are marked by the number of those interested, and there seems to be a general awakening throughout the entire profession regarding the responsibilities of the dentist.

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* Read before the Odontological Society of Chicago, Oct. 9, 1917.

This is only what it should be, if advancement is to be made, but it is not all that can be accomplished if we will only recognize the exigencies of the present, the future demands, and take steps to be ready for them.

There are about 40,000 dentists in the United States. Of these death and old age will demand its toll in the next four years, and those of active middle life will take their place as workers for the good of the profession; but what of the new blood?

Now comes war to take from the profession the younger element, to make of them dentists capable only of the most simple reparative measures, and this brought about by the hasty needs and temporary relief incident to war conditions, or may be to mould it into greater thoughts of service and duty, to give such opportunity as was never before offered to those wise enough and willing enough to grasp it. Opportunity to do what? To place dentistry where it belongs as one of the prime and basal elements of the health and welfare of the entire human race. One million —may be five millions of men—from all walks of life will have to pass under the care and supervision of dentists for a period of time, and this will result in a wider appreciation of dental service. And what of the dentists? Are they fully prepared for all the emergencies that may confront them? Do they realize the responsibility of the occasion? How many are preparing themselves for the results of war that will soon confront them? Not the dentistry we have been practicing, but the dentistry we must practice in the future. Now is the time for every dentist to take out of the bookcase his old textbooks and begin a systematic review of the subjects taught him as a student, his Gray's Anatomy, his textbooks on physiology, pathology, chemistry, histology and bacteriology, and afterwards some of the later works along these lines.

To be a "Doctor of Dental Surgery," as his diploma indicates, and not a mere mechanical dentist. To prepare himself to do such service for his country and humanity that will command recognition the world over. This is the time to show the world dentistry is a learned profession and its practitioners men of sound judgment and broad culture.

The profession responded nobly to the recent call for free dental service to the drafted men, but in a short time greater demands will have to be met and responded to as cheerfully. If all the sanguine expectations of those who look for peace before America can put her troops in the field are fulfilled, our preparedness will not have been in vain. Only good, and great good, to the dental profession, can come from a proper conception of the possibilities of the present times.

Study, is the answer to the problem. Study for the young and old, not neglecting the things of the present, but preparing for the questions of the future.

Steps should be taken *now* to organize and establish a Dental Hospital in this and other large cities. This society has fostered and carried into effect many good things for the dental profession, and *now* is the time to strike for one of the greatest benefits to humanity and the profession.

Dental hospitals, for the care of surgical cases, for the study of conditions only rarely occurring in the average practice and yet demanding a thorough knowledge on the part of the dentist, dental hospitals for the care of mouths of children of parents whose financial status or mentality prevents the future citizen from having dental service at the proper time. In several of our cities such institutions have already been established by members of the laity whose benevolence and farsightedness commend them to all humanity.

But Chicago has not yet heard from her millionaires. The dentist only can enlighten, and pave the way for such institutions, so here is more opportunity for the wise and thinking men of the profession. When giving becomes an everyday occurence, in spite of the many demands, there is always the desire "to do" for all worthy causes; so, in this time of charitable habit forming is the crucial period for accomplishing the desired end.

With this war as a stimulus to bring forth the best in all, our lives should be guided into more serious channels of thought, and our efforts in the direction of plans for the betterment of the race, so doing "our bit" that the world may be the better for our having lived, and our beloved profession receiving its just recognition among the learned professions.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-THIRD ANNUAL MEETING, HELD AT QUINCY, ILL., MAY 8-11, 1917.

STATEMENT BY THE EDITOR OF THE ILLINOIS STATE DENTAL SOCIETY.

Dr. W. C. Marks, of Galesburg, read a paper at the Quincy meeting of the Illinois State Dental Society, entitled "Oral Anesthesia." The following synopsis was published in the program: "Synopsis: The paper will treat of conductive, anesthesia, nerve blocking so called. The anatomy of the soft and hard tissues of the face and head with special reference to the mouth will be reviewed. The points of application at which solutions are introduced to produce local anesthesia in certain definite areas. Instruments used and their care and sterilization. How to prepare an isotonic solution, and in general the subject as we know it to date."

In explaining the failure to publish this paper the editor feels obliged to relate a very unpleasant experience and wholly unique in his editorial career. Dr. Marks' paper was given to the editor at the meeting, or immediately afterward, and soon after that Dr. Marks wrote to ask that his paper be sent to him for the purpose of making a few corrections in it. This was done, with a request that it be returned without any very long delay. After a long time had passed without the return of the paper several letters were written to Dr. Marks, asking for it, and in a letter to the secretary, Dr. Luthringer, it was mentioned that Dr. Mark's paper had not been returned, and under date August 7, Dr. Luthringer replied that he had talked with Dr. Marks over 'phone and he had promised to send his paper to the editor the same evening. It did not come, and after a week or two a rather sharp letter was sent to Dr. Marks, reminding him that the paper was the property of the Society and he had no right to keep it. This brought an angry reply, complaining of the treatment he received at Quincy in being obliged to read his paper to a small audience, denying any obligation to the Society, and saying that he had destroyed the paper some time previously. This letter received a reply from the editor, which need not be quoted here. Copies of the correspondence with Dr. Marks have been sent to Dr. Luthringer, the secretary, and to the chairman of the Board of Censors and to the chairman of Committee on Infractions of the Code of Ethics.

Edmund Noyes, Editor.

DISCUSSION ON THE PAPER OF DR. MARKS.

Dr. Frank L. Miller, London Mills:

Mr. President and Members of the Society: The subject, "Oral Anesthesia," so ably handled by the essayist, covers a comparatively new and very interesting field. Any statements I may make, I have gained from clinical observations.

The technic outlined by Dr. Marks is but little different from my own. One point I would like to bring out about the mandibular injections—should it be necessary to operate on both sides of the mandible at the same sitting,—first, block the right side, then wait the proper time—approximately five minutes, and get the proof, which is a numbness on the right side of the lower lip. Second, block the left side. In the majority of these twin blocks, the numbness of the lip, or proof, will be missing on the left side, due to the anastomoses of the right and left nerve filaments in the region of the incisors.

Therefore, don't jump to the conclusion that your second block is a failure and re-inject at once. Make other tests and you will find that, in most cases, the second block is all right.

I paint the tissue with iodin at the point where I am going to insert the needle and keep the fluids of the mouth away from this spot until the needle, which has been sterilized by passing through a flame, is inserted. I always use iridio-platinum needles.

Never completely bury the needle. Should breakage occur, it will be at the hub and can be withdrawn by pliers. I find the Hood glass sterilizer very convenient. It will carry three mounted syringes besides a novocain and dissolving dish, all immersed in absolute alcohol.

I use distilled water and make each solution as it is needed. I have not found it necessary to use the Ringer tablets.

Suggestion can be used to advantage here as in all anesthesia. In my office, we are trying to eliminate the use of two words—"hurt" and "pain"—in any manner whatsoever, because it is almost as great an error to say, "It won't hurt," or "It won't be painful," as to say, "It will hurt," or "It will be painful." The use of these words in any form makes an impression on the brain that produces fear.

I would suggest a more liberal use of the words relieve, help and ease, in preference to hurt, pain and fear. Remember, we have that old fear of pain, and horrible tales of the results of cocain to overcome in the minds of our patients. It can be done, but we must be master of the situation.

Complete confidence in the anesthetic and your technic are very important and essential.

The results of conductive anesthesia are little short of magic. I believe its use is indicated in the extraction of all broken roots and partial and complete cases of impacted teeth. The length of time, safety, sureness, and co-operation of the patient, either in dental or surgical cases greatly overbalances the only objection I have heard against its use, namely, the psychic effect.

In cavity preparation and pulp extirpation, it is far ahead of nitrous oxid analgesia. I have been the patient and tried both methods.

Dr. John L. Kirby, Chicago:

I want to thank the essayist for the hard work he has done in preparing this paper, and I think it is a shame that when young fellows of the state society come here with such a paper and discussion, that there are not a larger number here to listen to these young fellows talk. The lack of interest manifested in this subject is an indication that there are a lot of men in the State of Illinois who should get busy and get up to 1917 ways of doing things.

Conductive anesthesia, nerve blocking, is the best stunt I have ever put into my office, without any exception whatsoever. I am doing things today that I never before believed I could do. I have quit sending my cases to the extraction specialist. What is the use of doing this when I can care for these patients myself. I have tried nitrous oxid and every other means of anesthesia at one time or another; I have had all the apparatus necessary for such anesthesia, but I have discarded them in favor of novocain injection nerve blocking. I use, generally, a two per cent solution. However, I have used a great many injections of a one per cent solution. One of the requirements is cleanliness, and I have learned the art of keeping clean. I have not had half as much trouble with novocain anesthesia as I had with cocain, nor as much as I have had happen with gas.

Dr. John P. Buckley, Chicago:

I do not know why I was asked to discuss this paper unless it is to compliment these two young men here, which all of us want to do. I would rather discuss the remarks of Dr. Kirby. I rather enjoyed his paper yesterday afternoon, with the exception that Dr. Campbell took to it, when he said certain portions of Dr. Kirby's paper should be blue penciled before it is published. But this afternoon Dr. Kirby has nullified all he said yesterday. He said there were a lot of apparatus on the market, particularly gas outfits for producing analgesia, which he had purchased, and that he was unable to practice painlessly until he learned how to use conductive anesthesia. I thought he was a better business man than that.

There are lots of things I could say about this subject and the paper, but I do not think it is necessary. I would like to talk about isotonic solutions and their importance and significance. I would like to talk on that one point made by our nervous friend, who ought not to be nervous. Neither of these boys (referring to the essayist and Dr. Miller, who opened the discussion) should be nervous. They are well qualified to discuss these subjects.

One point relative to shock, and I do not believe I use the word pain and hurt very much, but I have used the word relief and ease. There is not any question as to the use of novocain and cocain today. Novocain should be used in every instance where you can get it, but I do not mean to say that cocain should not be used. Cocain has received a black eye for which it is not at all responsible. If you use cocain in the way that you are using novocain today, combined with these hemostatic agents, and with your ability of using suggestion and avoiding the possibility of shock, you would not have the so-called toxic symptoms manifested from the use of the drug as we did in days gone by. But that is not an argument against the use of novocain if you can get it. Novocain is less toxic than cocain. I never believed the statement that novocain is seven times less toxic than cocain, if we consider the relative power of the two drugs for anesthesia and the manner in which they are used. No one can gainsay the fact, however, that novocain is less toxic, and we ought to use that drug which is less toxic in these operations.

A MEMBER:

I would like to ask the author of the paper what is a safe dose of novocain to use, and I would like to ask him if there are any other agents, besides spirits of ammonia to counteract the effect of it.

A MEMBER:

I would like to ask the essayist in regard to the manner in which he would handle an abscessed tooth in extraction. Supposing he had to deal with a badly inflamed upper first permanent molar, what method would he use and if he would apply immediate extraction.

Another question is how much area would he advise blocking for one sitting, for instance, of both the upper and lower jaw.

DR. MARKS:

To extract an "upper first molar, badly inflamed," I would use nitrous oxid gas, but if you have not nitrous oxid it is a little dangerous. In fact, I do not think it is safe at all to infiltrate the inflamed area.

In regard to the amount of blocking one may do at one sitting, you can go just as far as you please with both the upper and lower jaw. In the country, where patients come from a great distance, I have blocked all over the mouth. I do not like to do it, but I have not had any bad results from it. I sent one patient out of the office with a towel; he was unable to swallow or to get water in the mouth.

DR. KIRBY:

I would like to know how many centimeters of the solution you inject at one time.

DR. MARKS:

Ten or 12 of a two per cent solution. I injected a quart in one case of a man who tried to commit suicide. His case was a rather interesting one. He used a butcher knife with the edge out. He went right through with the knife, severing the esophagus and trachea. The physician who called me in the case wanted me to give nitrous oxid gas, and after I got there I suggested that we infiltrate and use analgesia, so that the surgeon could repair his neck. I used the Clarke machine, and if you know anything about its construction, it is a high grade machine. I used a piece of ordinary glass tubing in a catheter and put the catheter down and anesthetized this man for nearly two hours. I have no idea how much novocain he took.

Dr. Buckley brought out an article in which he referred to the work of Dr. Silverman, in which he says he is very much in doubt whether there is a real idiosyncrasy for cocain. He has the same idea as Dr. Buckley, that if a man takes the same care in the injection of cocain he would not have bad results. I had a little experience of my own which some of you may not remember. The Wingate Chemical Company of Montreal brought out a preparation called analcain, which is supposedly the same as novocain. I used approximately 100 tubes of this agent before I found out that each one of these tablets had one-quarter of a grain of cocain in it. I was shooting cocain into patients by the handful, but my asepsis was good, my syringes were clean. I was using platinum needles and had no trouble. I may have been very lucky.

Dr. Buckley:

You used suprarenin or adrenalin with it?

Dr. Marks:

Yes.

A Member:

Do you make these injections in abscessed teeth?

Dr. Marks:

I would not inject an inflamed area, but supposing you are working on a lateral incisor that is abscessed, you may have to go through the inferior fossa to get it, but if there is no inflammation there to amount to anything you can infiltrate.

CHICAGO DENTAL SOCIETY.

A regular meeting was held Tuesday evening, October 16, 1917, with the President, Dr. P. B. D. Idler, in the chair.

Dr. John P. Buckley read a paper entitled, "The Diagnosis and Treatment of Destructive Diseases of the Dental Pulp; and A Method of Removing the Dead Tissue From the Canals."

DISCUSSION.

Dr. Fred W. Gethro:

Before entering into the discussion of the paper I want to pay my compliments to Dr. Buckley not only for the excellent paper he has just given us, but for the many good papers he has presented before this society, and for the high ideals he has always had in his teachings. The subject of pulp treatment, pulp removal, root filling or, most important of all, pulp conservation—practically all one subject—is the most important field that the dental profession has ever considered. I sincerely wish we had more men of Dr. Buckley's ability to continually bring these things before the dental profession. We must first get the profession thoroughly alive to the importance of this subject so that they will in turn teach its importance to the public.

I thoroughly agree with the essayist that the profession has ruthlessly destroyed pulps. More than that, I believe that the profession is very largely responsible for many of the pulp losses, for we are not practicing enough "preventive dentistry." A large percentage of pulp involvments could be prevented by proper care on the part of the operator, plus the co-operation of the patient. Both of these conditions are entirely feasible and in most cases easily obtainable. It is obvious that in the discussion of this subject lack of time will not permit one to enter into many details. It is perhaps sufficient to mention here that thorough painstaking examinations at stated intervals—depending upon the susceptibility, age of the patient, etc., followed by operations, every detail of which is carried out as perfectly as possible, will eliminate practically all of these pulp involvments.

A dentist who has the care of a patient's mouth conditions, and has the co-operation of that patient, should consider a pulp involvment in that individual as his own mistake. An operator who dismisses his patient having defective fillings, bad fitting crowns, faulty contacts, and similar conditions for some future time, just because the patient does not complain of pain or discomfort, is taking chances with the patient's future health, which he is not justified in taking.

Of all things that are productive of bad results, I believe the greatest is patching. I firmly believe that 90 per cent of all the patching of faulty fillings, bad crowns and other defective operations are the forerunners of future trouble, many of which result in the loss of the pulp. Our filling operations should be made and can be made enduring. They should be permanent operations lasting practically a life time.

I am entirely in accord with the essayist with what he says in reference to the importance of making a correct diagnosis of diseased pulp conditions. The correct diagnosis is the all important thing. I differ with him in the treatment and I will consider these differences in the order in which they were presented.

Treatment of Active Hyperemia Due to Caries.—For the first sitting Dr. Buckley advises the use of phenol compound, and for the second sitting the adjustment of the dam, the removal of the caries and the application of thymolized calcium phosphate and oil of cloves.

The treatment I would advise is break down overhanging enamel, establishing the outline of the cavity, immediately place the rubber dam and immediately remove the cause of the hyperemia. I would not put off that procedure one minute if I could avoid it. The delay in removing the caries is the direct cause of the present condition. Much might be said about the proper technic of this removal. I just want to call attention to two points. First, that all carious dentin in such cases should be removed with very large spoons, so as to avoid possible injury to the pulp tissue. Second, that all the carious dentin be removed. If the pulp is exposed or nearly exposed a capping of gutta percha or cement is the ideal method.

Dr. Buckley says, "In cases of actual exposure, I am now quoting from the active hyperemia class, the pulp should be destroyed and removed, unless some exceptional reasons obtain, etc." I cannot agree with this, and I don't think Dr. Buckley intends to convey to you that you should destroy all pulps that are exposed. For example, there are great numbers of pulp exposures in the mouths of children where the pulps (if properly capped) will return to a normal condition. It becomes a very important and a serious condition in the mouths of children, because in many of these teeth the roots are not fully formed. In most of these cases loss of the pulp means loss of the tooth, regardless of the value or importance of the tooth.

We must ever keep in mind that pulps in the teeth of children will recover very much quicker and much more certainly than will pulps in the teeth of adults. This is largely due to the increased size of the foramina, which means a much greater blood supply.

To do any less than to make every possible effort to save the pulps in teeth that are not fully formed, regardless of the exposures, is a mistake. It is a duty, not a question.

My experience with arsenic as a safe destroyer of pulps was shattered many years ago and my continued observations and study of this subject strongly confirm this previous opinion. Note that I designate this as an opinion. Nothing definite has been given to the dental profession as to whether arsenical destruction of the pulp is or is not responsible for many of the injuries to the peridental membrane at the apices of the roots. We all know what arsenic will do when it leaks through a temporary filling or when it reaches a false opening in root canals or pulp chamber. The great destruction wrought in these cases seems to show beyond question that it is not self limiting and also shows very conclusively that it is an extremely dangerous drug. Many of the best men in the profession have abandoned the use of arsenic, and I firmly believe that before many years it will be eliminated by all the best informed dental practitioners.

Acids.—I do not believe that the use of acids is necessary or safe for the average operator. I am entirely opposed to the use of acids for the enlarging or cleaning of the canals. I am also opposed to the use of strong medicaments in the canals. It seems to me that the dental profession has failed to appreciate the valuable lessons that we get from the medical profession. The best surgeons today have abandoned the use of antiseptics within the tissues even in infected cases.

How does the surgeon of today treat his infected cases after an operation? He turns the case over to the intern with instructions to wash the parts with sterile water. The use of antiseptics retards the healing process. I am sure that as we study this subject we will very largely abandon the use of these strong agents within the tissues. It is not possible to even mention all the important points that should be included in the discussion of this subject, to say nothing of details. For that reason, I have summed up a few in condensed form and will conclude my discussion by referring briefly to the following points:

All rubber dam treatment hermetically sealed. (Temporary stopping.) Two or three treatments is sufficient for practically any root treatment and filling, regardless of conditions or complications. Root canals should be filled as soon as they are clean and sterile.

Never use any medicament in the treatment of canals that could possibly injure the tissue at the end of the root. Never twist a broach. Only one instrument is thoroughly safe and that is a barbed broach. Use the X-ray films. In conclusion, let me again express my personal appreciation to the essayist.

Dr. J. G. Reid:

I have been very much interested in this paper. I have read it a number of times. The chief points in it are confined largely to the tissues of the pulp canal, the canal itself, and not beyond, except incidentally. If I can interpret the knowledge that I have gleaned from my reading on this subject, I am led to believe that we are progressing. We are not dealing with the subject that is new; we are simply dealing with a cycle of it. I can remember, forty years ago, when this subject was dealt with and discussed very freely, and if any of you desire to refresh your memories, it is no trouble to turn to the records of the men, many of whom have passed beyond, who were members of this society and of the state society, who discussed this question at that time equally as intelligently as we are discussing it today. I shall try to confine myself to the subject of the paper and not go beyond it. We are not dealing with the filling of root canals, but with the removal of the contents of pulp canals. We have advanced in this respect that our technic is easier, and this development in technic has been brought about by men who have specialized and made an effort to do what we failed to do many years ago; but I must say to you that within my own experience, which has covered the period I have just mentioned, pulp canals were filled equally as well then as they are today. They have been made serviceable and useful, but that has been done at the sacrifice of gray hairs, hard work, dogged determination to accomplish that which they started out to do, and we have got a little of that pugnaciousness still lingering in us today. The conscientious practitioner of dentistry who endeavors to try to treat his patrons and give them the best dentistry that is within his power to give them, recognizes as much as any one in this audience that it is very essential for him to do this. That point has been very clearly brought out by the essayist, who has expressed it better than I am able to do so.

I remember a few years ago when it was a very difficult matter for me to remove the contents of pulp canals, and it was done by mechanical means only. We did not have radiographs to help us out then. We had to do more or less guessing. Now, there is no excuse for our guessing at anything. When I have a tooth that has to be operated on, I want to take a picture of it before I start it. I want to know what I have got to work on before I start to do anything, and I do not know of any other way than to have a photograph of it. If I have a photograph I do know the kind of canal I have to operate in, and some of them I do not expect to start on at all because there is no living man who, by any process mechanical, chemical, or anything else, who can remove the contents of some of these canals, but I am firmly of the belief that a very large percentage of the work that we do in the removal of the pulp tissue from pulp canals can be done successfully, and the results will be permanent after it is done. We need never have much fear of subsequent focal infection beyond the ends of the root. I must confess, however, that with my knowledge, experience and technic, I cannot remove the contents of a pulp canal in all cases. If I have nice, beautiful, round, cylindrical canals to put a broach into, I expect I can get the contents out of those canals as readily as any one, but we do not have such conditions to deal with constantly. There is only a small percentage of cases that we have to work on in which we can do this. The other large percentage of canals we have got to treat in some other way than to deal with them mechanically, and we cannot do this until we get the pulp canal in such a shape that we can work in it. To do that we have got to get into the canal.

The methods that have been mentioned by the author of the paper to my mind are sound. They are sensible, and it has been demonstrated to me very conclusively in my practice that they are, and I do not believe the author has presented to you in his paper anything that the ordinary and conscientious dentist cannot do if he wants to do it and will take the pains and time to do it. I do not believe there is any one in this audience who can offer a reasonable excuse for not doing it. I have labored many hours in opening up a pulp canal, and I have just perseverence enough when I get one of these cases to stick to it, and I will get somewhere after I start out. I do not get discouraged because some of these cases are very difficult to treat or because I happen to have a pulp canal that seems a little awkward to clean out. I will work at it, and if I get tired, seal it up, dismiss the patient for the time being, have him come back and go at it again. That is my way of treating these cases

It is a pleasure to me to try and treat one of these cases that is real bad. I say this honestly. To me it is an encouragement, because I feel I can accomplish what I start out to do after a while, and there is a lot of satisfaction you derive when you have accomplished it. We have some difficult cases to contend with, and it takes time to treat them properly.

As to the use of chemicals in these cases, I must say they have helped me, and I am going to continue to use them. There are three things about the chemical business that please me. One is that chemicals enable me to enlarge one of these tortuous root canals comfortably. A nice, slick, grayish little substance enables me to use a broach in the canal with considerable comfort. It slides away off where you want it to go, if you do it carefully. Most all mistakes are made by plugging up pulp canals when you start. I have been through the mill; I have had my mistakes, and I have had to correct them, and I have done it. I have helped myself a whole lot by taking care of the conditions before I got started. I want the pulp chamber cleaned free from everything that is liable to get past. I want to be sure that nothing falls into the canal, or that I am pushing something into it that I cannot get out.

As to the use of phenol sulphonic acid, I want to introduce it in there and leave it two or three minutes before I operate. Some dentists go to work as soon as they introduce it; I like for it to soak in a little while. It helps me a whole lot. It furnishes a lubricant for the canal, and then I take a fine broach so that I will not plug up any of the canal with anything ahead of me. When I find the broach goes along very nicely, as it usually will, then I venture to use something a little larger and a little larger, until I have gotten the canal in shape after a little while where I feel pretty well satisfied I have done what I can mechanically and chemically. Not only that, but when we are working in these canals we do not always know positively that we have destroyed these disease germs. They are always present. We know that when we introduce phenol sulphonic acid it is going to help us. I do not know that formo-cresol is going to help me very much in this matter. However, it may a little bit, but I want to tell you that when you get a little phenol sulphonic acid in there, or rather sulphuric acid, some of these germs will get badly squeezed and will get burnt up. You burn up these microorganisms by your sulphuric acid and put the canal into an aseptic condition. I believe that medicinal applications are necessary in connection with this work. I do not think they should be discountenanced. I do not believe it is possible in all instances for us to fill pulp canals and feel safe unless they have had some preliminary treatment of that kind.

I have been led to believe from men who have paid some attention to this subject that the dangerous agents, the microorganisms, are found within the pulp cavity itself. They are there to start with.

This paper has not gone beyond the confines of the pulp canal; I am speaking of that phase of the subject and am not going beyond it. When I have used this agent it has been a Godsend to me. I have done better service to my patients than previously since the introduction of the use of phenol sulphonic acid. I used sulphuric acid considerably before, but it is not so pleasing for me to use as the other, and I have not had any trouble about any blocking from using anything of that kind. When I have an old, crooked, or tortuous canal that I cannot get through, I generally find that out before I start, and if I do, I do not start it. That is my way of dealing with this proposition, and I am not going to take any chances on killing somebody in half way filling these canals.

I have not been able to fill all the root canals that I have tried to fill. I do not profess to stand before this audience in any such glimmering light. I have had my failures, and I have had my successes and I do believe I am more successful today than I have ever been in my life in the work that I am doing.

I have never believed very much in active and passive hyperemia. I mean by that, I cannot get worked up to the point where there is a dividing line as to what I ought to do and what I ought not to do. Some dentists seem to be able to do it; I cannot do it.

There are many pulps unquestionably that have been needlessly destroyed. There is no doubt about that, because dentists go on the principle that dead men tell no tales, and when a pulp is dead you are not going to hear very much from it in that direction. They forget they may jump out of the frying pan into the fire; but the gentleman who opened the discussion on this paper specifically stated why we should try to save pulps, although it was referred to only incidentally by the essayist. It was specifically stated that in young subjects particularly we should exercise great care in trying to save the pulps of teeth. Many years ago when this question was new, just as new to us then as it may seem new to you today, and when there was a discussion on capping pulps and saving them, there were many speakers at that time who said they could save pulps under all conditions. In other words they could cut off half of them down the canal and save the rest of it. If you read the literature of that time you will see this. There were those who said they cut off pulps in any state of disease, cap them, and they would live. The late Jonathan Kennicut said he could do this. We know that it cannot be done. Dr. Harlan's rule was something like this, and I believe it is a good and safe rule to follow: he never tried to save an exposed pulp or a hyperemic pulp in a patient over 21 years of age or an adult. He never regarded it as good practice, and I believe it is an unsafe procedure. He was pretty nearly right. The conditions set forth in this paper do not require destruction of pulps. The pulp ought not to be destroyed under such circumstances. I am not much of a believer in capping pulps. I firmly believe that if I had to destroy a pulp I would be fully conscious of what I would expect in the future and what is expected of me when I destroy a pulp. It is true, most of us destroy pulps or have done so when they ought not to have been destroyed. I will admit that. My conscience, however, is not troubling me much. If I proceed to make up my mind to do that procedure, I do it unhesitatingly, and I guess I can do it as well as the next fellow in dental practice.

Dr. John D. Millikin, of San Francisco, was asked to take part in the discussion. He said: I feel kind of proud of being from San Francisco. Dr. Buckley read a paper similar to this in San Francisco and showed us most of these slides that he has shown you this evening. He made the remark or rather intimated that we shoved off a lot of unfilled root canals for him to amputate. I feel something like Dr. Reid, that I cannot fill all root canals to the end, and as he has said, the longer one is engaged in practice the more he knows he cannot fill them all.

Dr. Edgar D. Coolidge:

I am sure we have all been benefitted by this splendid paper tonight and by the discussion, and by continuing this same line of thought and discussing little points of differences between the different men we can hope to accomplish something. By going over this subject time and again it brings us closer together in our views, and we will have a more standardized and uniform system of diagnosis and of operations upon root canals that will not only benefit the profession but the people whom we serve. I am sure that there is much better work being done now than there was two or three years ago. We see evidences of this right along, and yet we still see evidence of very unfortunate things going on as before. We still see lots of root canals with oxypara and other soft materials in them that we can hardly tell what they are. Some of these Dr. Buckley has described with his radiographs, and it is unfortunate that these things continue. If we could only get away from these things and stick to those that are safe, it would be much better for us and of great benefit to our patients.

I have not much to say in regard to the diagnosis of the different diseases of the pulp. It is a little hard to draw the line of demarcation between the two. I believe in saving every pulp that can be saved, if it is possible, and to preserve a pulp that has been exposed slightly; but I would rather remove a pulp before there is any infection in the root canal than have the pulp die and remove it afterwards. That is a safer procedure and there is less danger of disease if we have a clean case to operate on than one that becomes infected.

There is nothing further I wish to say on the subject. I did not hear all of Dr. Buckley's paper for which I am very sorry. The points discussed and brought out, I am sure, have covered the field and have given us many thoughts that will be well worth carrying home with us and carrying them out in our practice.

Dr. C. W. McGinniss:

I have only one comment to make in connection with Dr. Buckley's paper, and that is in regard to the histology of the pulp. If you will consult the literature I think you will find that Dr. F. B. Noyes pointed out very clearly within the last year that the lymph glands are perivascular in their character and can be demonstrated within the pulp cavity.

Dr. Buckley (closing):

I will only detain you a short time in answering the points that have been raised. Dr. Gethro misunderstood me when he thought I would attempt to treat a hyperemic pulp without first outlining the cavity and removing as much of the carious dentine as could be done at that time without producing unnecessary pain. Dr. Gethro also failed to catch my meaning with reference to exposed pulps.

I said, unless some exceptional case prevents for preserving the life and functionating activity of the pulp *(and I thought Dr. Gethro had read my book, which he has not)*. I would not attempt to save a pulp in a tooth the roots of which were not formed. A little patient was in today, and in outlining the cavity in an upper second bicuspid and removing the carious dentin I exposed the pulp. I expected to anesthetize that pulp subsequently, but after I had taken off the rubber dam, in talking to my little patient about the first bicuspid in front of this, she asked me if I did not remember what happened two years ago, and I said no. She said you did something, you went to work on the tooth, and I fainted, and you had to take the rubber dam off. I found on looking up my records that I attempted to remove a devitalized pulp and the patient, being highly nervous, fainted from fear, and subsequently I sealed in an antiseptic paste which is in that canal today. So I said to myself, "excuse me." After talking to the patient, and knowing she is still quite nervous, I am not going to anesthetize that pulp. When she comes again I will cap the pulp, even though I know she is about 17 years of age, and under ordinary conditions I certainly would remove it with the exposure I have to contend with.

I admire and appreciate Dr. Gethro for more reasons than one. He is honest, sincere and conscientious, and when he disagrees with you he has reasons for so doing. I never expect him to follow my method of treating teeth. My hair is getting too gray to expect anything of that kind, and I am not going to take your time to argue with him about using chemicals in connection with our mechanics in the removal of this tissue from the canals of these teeth. I know Dr. Gethro gets results, or he would use acids or alkalies in connection with his broaches, but how he gets those results I have been unable to understand. One thing I cannot understand is how you are ever going to sterilize the dentinal structure of a tooth where you have had an infected pulp and it has undergone the process of decomposition without sealing something in that canal strong enough to affect deleteriously, if you please, the tissue beyond the periapical region if some of it gets through. I have never yet been able to find a disinfectant with which I could kill germs in the canal and dentinal tubules of a tooth that, if it got through the root-end, accidentally or otherwise, would not affect deleteriously the tissue in the periapical region.

You notice I said in my discussion of these slides that six months ago, as a result of some of the statements made by our investigators as to the use of arsenic and strong disinfectants, and the hopelessness in the attempt to treat some of these cases dentists were left absolutely without hope.

I did not intend to imply the things about the California dentists that my friend Dr. Milliken from the coast rather jokingly mentioned. Six months ago dentists were practically hopeless; today they have hope. If you have not read, I want you to read from cover to cover the last issue of the *Journal of the National Dental Association,* and if you do not read anything else, read the editorial. I do not know who wrote it; no name is attached to the article. I am sure, it was not written by the editor, Dr. King. It sounds like Hartzell to me, and if it is Hartzell, he has interpreted a German article which was misinterpreted years ago. Some of my friends in the east say that Mayrhofer claims that he could not sterilize the dentin of a tooth with formo-cresol. Hartzell in interpreting this article says that Mayrhofer claims he cannot sterilize the dentin of a tooth with cresol and formalin. I have been waiting for the appearance of such an article for years. The evidence which has been accumulated goes to show that the temporary effect of the strong disinfectants upon the tissue of the periapical region of teeth is of secondary consideration to the sterilization of the dentin of that tooth; that the dentin of the tooth must be sterilized before it is filled or all your efforts fail. If in sterilizing the dentin of a tooth you accidentally or otherwise affect deleteriously the tissue in the periapical region, it is only temporary, and nature will correct the damage done. I have been waiting, as I have said, for years, to have a man of some scientific standing and attainment make a statement of that kind, and such a statement appears today in the last issue of the *Journal of the National Dental Association.* And so while I could never expect Dr. Gethro to agree with me with reference to the use of certain medicaments in the treatment of teeth, I do not know as I can ever expect to agree with him, but surely I will the moment he convinces me that I am wrong.

I agree with Dr. Gethro and Dr. Reid thoroughly on their insistment of the rubber dam in the establishment and maintenance of asepsis throughout the operation. I agree also with Dr. Gethro thoroughly on his insistence of these remedies being hermetically sealed in the tooth, and he is absolutely right when he says you have not begun the treatment until you have hermetically sealed the remedy in the tooth.

I appreciate the remarks of my old teacher Dr. Reid. I know how I used to hesitate to have him come around and inspect my root canal fillings. I am glad now we did not have the radiograph in those days because I do not believe I would ever have gotten through my root canal work.

I also appreciate his reference to my other old teacher, the man in whose footsteps I have been following for a number of years, Professor A. W. Harlan, that great scholar and thinker. We are all glad to have Dr. Milliken here and wish other good men from the coast were here with him, so that they could sojourn in Chicago for a few days on the way to the meeting of the National Dental Association.

I want to mention two things about asepsis, and then I am through. I have been trying for years in my root canal work to get a satisfactory furnace or sterilizer with which I could sterilize my cotton and gauze and such material as is necessary to use in this work that cannot be sterilized by the direct flame, by moist heat—I mean by boiling or by chemical agents. Dr. Arthur D. Black has solved that problem for me in furnishing a little heated dry air sterilizer where I can keep broaches wrapped with cotton, and gauze for use in my surgery in root canal work, sterilizing them by means of heated air.

We ought to appreciate the efforts of any man who will give us any kind of instrument or apparatus that will aid us in accomplishing this work in as nearly aseptic conditions as can be done in our offices. Dr. L. L. Funk came into my office and showed me a simple device; I do not know whether to call it an apparatus or not. At any rate, it is an instrument with which I or you or any one can pick up sterile cotton with a sterile pair of pliers, and in a moment's time you can pack it down in that little sterile apparatus or appliance and pick it out and you have a nicely packed pledget of cotton. Any man who will work along this line and give us sterilizers and instruments, or other means, chemical or mechanical, with which we can accomplish this work better than we have done it in the past, and we are doing it better today than we have ever done before, should receive credit and encouragement for his efforts.

WISCONSIN STATE DENTAL SOCIETY, FORTY-SEVENTH ANNUAL MEETING.

Held at Janesville, July 10-12, 1917.

DISCUSSION OF THE PAPER BY DR. E. S. BARBER, "THE DUTIES OF AN ASSISTANT."

DR. I. M. HOLSAPPLE:

I think Dr. Barber has given us a good many reasons for having an assistant in a dental office. One of the principal things he has impressed upon is that the patient is the first consideration. He has impressed us with the idea that we are giving personal service. Many times an assistant can do that better than we can and more agreeably to the patient. There are so many things in a dental office that it takes an assistant a long time to become familiar with them all, but after you have instructed her in certain things you have a right to expect that your instructions will be carried out. The Doctor spoke about having the assistant asking questions, she should always ask but always out of the hearing of the patient; that should be impressed upon all assistants, first to know they are right and then go ahead. These little personal attentions being cheaper for an assistant to give than the dentist, it is her place to offer them, and then there are so many things an assistant can accomplish in so far as the operations are concerned.

The Doctor spoke about the neatness in the dental office; if the office is not neat, the assistant is to blame it seems to me for she ought to notice things like that before the dentist does. Then we have to get acquainted with little patients; one of the nice things in having an assistant is that they will get acquainted with these little folks before hey get into the dentist's presence, and I notice that some times if they receive this training they act better than some grown patients. In addition to the assistant's looking after the little patients, she can take charge of the general bookkeeping, which is a very good thing to relieve the dentist of these details.

Another thing the doctor spoke of that the assistant can do, and that is getting information, she can get in two minutes what it would take the dentist twenty minutes. I understood Dr. Barber to say that the dentist does not get into the reception room, but has the assistant bring the patient in; it is a great loss of time for us to go out into the reception room. There are times when we are worse off when we do go out and an assistant can take care of a patient and ask him to follow and get him when in shape when we could not do that.

In the work of the chair the assistant can be instructed so that she will know what instruments we are going to need and have them out ready for us to use. Dr. Barber also spoke of supplies; the assistant can keep track of those records which will relieve us of all responsibility when the salesman comes in. There is one thing we all are bothered with: Once in a while a patient comes in who is unreasonable, and complains that your assistant has not been ladylike or some other complaint; you know it isn't true and yet you must protect yourself. I want to thank the essayist for the able manner in which he has taken up all the details of this situation. Thank you.

Dr. H. G. Morton:

I would like to know how any man could discuss that paper of Dr. Barber's. He would have to be a lecturer and a moving picture man. It would be a lot easier to talk about my own practice, but I believe there is a very valuable lesson to be learned from what Dr. Barber has told us. Of course, all he said cannot be applied to every dentist in this room. There were many things I might mention that are of help, but there is one suggestion that is worth its weight in gold to me, and that is the suggestion of puncturing the rubber dam and putting a tube through on the outside. No dentist can afford to be without an assistant; there isn't any man practicing who can attain proficiency without a trained assistant, and if a man thinks he can get along without an assistant he is losing money, and he is not turning out the kind of work he should. Each office should have at least one assistant trained according to the clientele of the operator. I have had but one girl ever since I began to practice twenty-one years ago, she doesn't like me to say how long it is, but I doubt if there are very many who still have the assistant they started out with. I have gotten so that I cannot get along without her, she is as much a part of the office as I am myself. However, it is important that every man should realize the clientele of his office and the type of work he has to do, and then train the assistant to help him. I do not believe you can all follow in detail all the Doctor told us, but we can take a great deal of it. An assistant must be trained to be an assistant and a young man that is starting out in practice—it is younger men need the advice of the older men—has no business to think of what his fee should be. Delivering the required service to the patient should be the first consideration. There is another class of men, those who you might say are in the middle part of their career, he can consider fee, he can consider service and he can take all the lessons Dr. Barber has thrown upon the screen. There are so many things I could tell you from my own experience—but I want to impress the importance of training your assistant and if you will take this trouble she will pay you back in service for the dollars you pay her.

On the question of anesthesia, I am simply going to say that the dental profession is in a position they never before occupied. I do not believe we should go at it in a slovenly manner, I believe we should not use anesthesia without a more positive knowledge of the physical condition of the patient; without giving him a thorough preliminary blood test, these are so simple today there is no excuse not having them made, and I believe the profession will be held derelict if it fails to take these precautions. It doesn't take five minutes to learn whether or not the patient is a fit subject for an anesthesia. We should have a better knowledge of our patient condition and use more freely the X-ray.

I have a friend who is a court dentist at Sweden, he does not have a single instrument in sight. After the patient is seated, the instruments are carted in. Today we have such beautiful sanitary equipment, but that reminds me of a little thing one of my patients who had been in California told me; she had to see a dentist there and she told me he had the most beautiful office she was ever in, tile floor and all that, but the operator didn't have the faintest conception of the little things that make a patient comfortable. For instance. she said: You always put water on the stone before you put it in my mouth, the California dentist never thought of that, and it caused me pain because no one ever thought of cooling that stone. It is courtesy, the little kinds that create confidence, and if you can inspire this confidence it is vastly more valuable than costly or beautiful equipment. You must realize that the prime factor is delivering to our patient service that is worth something. I say there isn't a man who is practicing dentistry but can give better service if he thinks of these things.

President: I wish to thank Dr. Barber for his paper.

Meeting adjourned at 9:50 P. M.

THE ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting of this Society was held on October 9th, 1917, at the Chicago Athletic Club, Dr. F. E. Roach presiding.

Dr. L. L. Davis read a paper entitled "The War and Its Effect on Dentistry."

DISCUSSION.

Dr. C. N. Johnson:

Mr. President: I am very glad that Dr. Davis was not able to get the essayist he started out for, because this paper to-night that he has prepared practically on the impulse of the moment is not only timely, but it is a paper that fits very nicely into a matter which has recently taken place which effects vitally the future of dentistry. I refer to the recent legislation at Washington. It seems to me that this legislation coming at this time gives to dentistry a status which it has never enjoyed before. It is a more significent legislation than most of us recognize. It is a matter of congratulation that it is legislation which places the profession of dentistry in the eyes of the Federal Government on a par with the profession of medicine. It is not only a matter of congratulation, but it places on the members of the dental profession a new responsibility that they never assumed before. If we are going to be equal in the eyes of the law with the members of the medical profession and if we are to keep faith with our legislators, we must so conduct ourselves as to justify their confidence.

That seems to me to be more serious than we realize. We must consecrate ourselves anew to the science of dentistry. We have been too absorbed with the mechanics and the art of dentistry. First of all there should be scientific study and training. That must be the future not only of the profession but of the educators of our students.

I was very glad to have the essayist refer to the loyalty that has been demonstrated by the dental profession, particularly in our city. In the emergency which arose on the occasion of the drafted men being called to camp within the last few days this loyalty was particularly impressive. We had a representative here in Chicago from the Surgeon-General's office bringing to us the message that the soldiers who were going to camp should be prepared by dentists, so that they would be dentally fit when they reached camp, provision being made for their care by the army dentists after they got to camp. So it remained with the dental profession to make those men dentally fit before they went there. I happen to know something of the royal and loyal response made by the dentists of this city within the two or three days after the notice had been sent out asking for volunteer service. Far more men volunteered their services than we needed to care for all the men who applied for service. That is explained in part by the fact that some of these boys had gone to their own dentists, but there is always a large percentage of drafted men who accept services without being dentally fit. That will be more apparent in the future than in the first draft, so we must keep up the enthusiasm of the dental profession to meet the emergencies which are to come. We hope before the next draft to have more extended notice sent and the work systematized better so we will be able to get some of the others into service and take care of the boys in a more scientific way, but I do feel that the dental profession by reason of the service rendered to the men who need it will justify all that the government has done for it.

The question has sometimes arisen and we encountered it when the notices were recently sent out—that the dentists would report back to the committee that certain drafted men who applied for services were able to pay for those services. Now I take this stand that no dentist should hesitate in any case where a soldier boy applies to give that service gratuitously without asking any questions as to whether he is able to pay for it. God knows the boy who shoulders a musket and goes into the trenches sacrifices more than you or I will ever sacrifice in giving him whatever dental service he requires. The impression should go out that every boy who goes into the United States Army is entitled to free service from the dental profession. Many of these boys go into the fighting line under terrible sacrifice. Many of them have lost their positions and every one of them has made more sacrifice than you or I can ever make. That question should never arise in the dental or the medical profession.

Now Mr. President, I want to congratulate Dr. Davis on his paper. It comes just at a time when we need it. It deals with a subject that is close to our hearts and I am sure that the members of the Odontological Society will feel a new consecration to their profession in the light of their relationship to the Government under which they live.

Dr. P. J. Kester:

Mr. President: I was very pleasantly surprised with Dr. Davis' paper. I feel a good deal as Dr. Johnson did about it. He seems to have discovered some ideas that he did not know he had and it is probably a little of the general stimulation that is abroad at this particular time. It seems to me that that is one of the best papers I have heard for a long time. I think we all feel and have felt for years that the dental profession should have recognition, but we have also felt that a very large portion of the dental profession did not appreciate the importance of the profession, that is to say, they considered it a sort of means to an end and the real professional end has been neglected. As Dr. Johnson has said, if we are going to be recognized, we will have to change some of our methods. Ever since I have been in the dental profession there were a few of us who thought we ought to attach ourselves to the medical profession and some did, but it was found that that did not work very well. We found that the medical man who came into dentistry came into it because he thought it was perhaps a more easy way of making a living. Most of them I have come in contact with when I was in college work rather looked upon us as inferior in general scientific knowledge. I think they have gotten over that to a very large extent, for certainly they have finally recognized us as standing on the same general ground as the medical man.

Of course as Dr. Davis and Dr. Johnson have suggested, it is the duty of the dentist to so prepare himself so that he can meet the medical man or any other professional man on the same ground. They can do it and they do do it and the proof of that is that they have finally been recognized. I think Dr. Davis' paper is an excellent one and he could not have selected at this time a subject more important than the one which he did.

Dr. J. E. Hinkins:

Mr. President and members of the Society: I enjoyed the paper very much. I must say frankly that I was disappointed in the essayist's reference to the text-books. He recommended Gray's anatomy, etc., etc. He did not mention biological and physiological chemistry. You all know that I am a crank on chemistry. You know I am to read a paper before the National Society on "The

Action of Phosphate of Calcium." I have lived with chemistry and slept with chemistry for the last few months. Of course if the essayist did not refer to chemistry in his paper it would not be complete to me.

The paper is good; it is opportune. I have been associated with Dr. Johnson and have worked with him on this work. The dental profession did come to our assistance most loyally. I am proud of it and I am proud to say that, being in the position I am, the downstate men have more than doubled the city men in the services rendered to the selected men. In the interviews I have had with the different cantonments I have been received with the greatest courtesy. We had not more than ten days for we were called together first on Friday, and the next Tuesday week the men were called to the army. I will say in round numbers that there were thousands of teeth filled and thousands of teeth extracted. On Friday we had, as Dr. Johnson said, more dentists in the city volunteer their time and services than we had patients, but in many outlying towns and cities there were many dentists who worked all the Sabbath day for the soldiers. They could get at the men better and they had more time and they could go to the office of the exemption board and get a list of the men and send out cards making appointments. We sent out cards asking for volunteer services and had I known Dr. Davis was going to read a paper on this subject, I would have brought in some letters to let you know the splendid work they have done. It is very gratifying to us certainly. One of the officers in the cantonment asked that if the army dental surgeons were not able to take care of the men's teeth, what would we think of arranging to go to the cantonment and take care of the soldiers. I said, "All you have to do is to say you need us and I assure you that if you will give us a week, we will have two or three hundred dentists and we will give our time and equipment to do the work." He said, "I thank you from the bottom of my heart in behalf of the grand state of Illinois and the Government of the United States."

Now there has been other work going on. I was just talking to Dr. Johnson, who is president of the Central District. There are nine states we have to look after and in the city of Chicago we have 88 divisions for examining soldiers. There are three centers, the north, south and west sides. It fell to my lot to take care of Illinois. I have been in communication with different men and they have assured me that any assistance they can render me, they will gladly give. I just received a letter from the president of one of the districts giving me the names and addresses of the 88 divisions, so I can communicate with the physicians directly and at our next selected draft, we can have dentists present at every one of the 88 divisions. When we examine the teeth in cooperation with the physicians, we can always make a chart of the teeth to be extracted and the teeth to be filled, so that at our next draft we will not have to work with such a rush, but can work more systematically, assigning men to the different divisions. This last time it was done so hurriedly that we had no opportunity to keep records. I think the men outside of the city did. I do not know just how many we took care of, but it was a good deal more than we expected. I was surprised at a report I got only yesterday.

Coming back to the paper again it seems to me, gentlemen, that there was never a time when there was greater opportunity for scientific work than there is to-day. I do not remember whether it was the essayist or whether it was Dr. Johnson who made the remark that we would have to change our curriculum of study. Dentistry is no longer a mechanical proposition. We have got to deal with the scientific problems of the day. We have got to know more about diet. We have got to know more about the general conditions with which the public are daily coming in contact. We have got to know more about the X-ray. I have been led to the conclusion from the observations I have made, not only with the men here but in other parts of the country, that our X-ray work is rather elementary. Do you know that when I visited M. L. Rhein, of New York, and saw the work he has done by X-ray and then looked back at our X-ray pictures and saw the mistakes that we have made it made me feel badly. He has made some mistakes also but he has done some good work with the X-ray. For instance you take one X-ray and it will show an abscess and probably another X-ray of the same tooth will show only a shadow of cicatricial and scar tissue. There have been thousands of teeth sacrificed and no occasion for it. And so when we take that into consideration and also take into consideration the food status of today, it makes us think that we need better training along scientific lines. I had the pleasure the other day of taking dinner with one of the largest food producers in the United States and we were discussing the different breakfast foods, flours, etc., when this question came up. He said, "Doctor, what percentage of the teeth of the people as a whole are taken care of?" I said, "I cannot give you the figures exactly, but what do you suppose?" He said, "75 per cent." I said, "I have a good deal of respect for your opinion, but you have another guess coming. I think it is not quite 14 per cent."

DR. JOHNSON:

The estimate is about 20 per cent.

DR. BROPHY:

Twenty per cent is a liberal estimate.

DR. HINKINS:

I thought it might be 14 per cent, but I doubt. I was surprised. On talking about the foodstuffs and about the assimilation of phosphates, he said, "Do you know about what per cent of mineral substance is in our white flours that we daily eat?" I said, "Yes, I have an idea; I just got a report from one of the biggest flour mills in the United States, and what per cent of mineral substance do you suppose is in white flour?" He said, "5 per cent." I said, "According to my statement it is four-tenths of one per cent. That is all the phosphates and mineral substance in our white flour." If there is too much it turns the flour yellow and does not suit the housewives, etc. They do not want to use it, so it goes to show that there are so many angles and so many different things that are reaching out into the dental profession which a few years ago we did not consider.

I do not know how it is with you gentlemen, but within the last five years my patients, especially women in confinement and nursing mothers, come to me more than they do to their family physician, asking, "What should I eat?" Hardly a week passes that I am not called upon to consult with a physician regarding the diet for women in that condition. If we are going to be put on a basis with the medical profession we have got to wake up. We cannot go along patting ourselves on the back that we are a part of a learned profession when we are not. There are so many avenues open to the liberal minded man today that it is imperative that we better prepare ourselves for the future. If we go into organic chemistry and see the efforts put forth in chemical life to produce life and to produce the elements of life, we have got an incalculable work before us, and an awful lot of hard study before we can meet it on a professional basis. I thank you.

Dr. J. G. Reid:

Mr. President: The reason this paper took me by surprise was because it has opened up a subject we never expected to hear. I really was pleased with the essay because it is a model one and it is a timely one, and its timeliness makes it unexpected at this moment. I do not know that I can add anything to the discussions that have already taken place on this paper. They have opened up questions not expressed in the paper at all. If the essayist will allow us to go a little beyond the confines of the paper, I might say that there is one thing we have got to look out for in the future which has never been done in the past. We have got to be better educated men than we are today. There is no doubt about that. We have got to think about the things that are coming into our lives as a profession today that a year ago would have been passed by in a very thoughtless way. They are coming to us in pictures so fast that we can hardly examine them as they should be. The curriculum of our schools is going to be wonderfully changed in the next four years. I believe there will be a very marked improvement in our educators in the training of the coming young men. It will be new and it is going to occur along the lines already mentioned by Dr. Hinkins. We are as a human family a lot of very poor individuals. That is my opinion. We do not live in accordance with nature's laws. We have got to come closer to nature and get outside with God's sunlight and His green earth to teach us a great many things that now lie hidden that are going to open our eyes in the future. It is going to develop very wonderfully in future years, and it is going to be along the lines that Dr. Hinkins has outlined. I do not know what the contents of his paper will be at the National, but it seems there is a great field of thought if properly presented that is going to do a lot in giving us some information that we probably know little about. I do not know, and I am not qualified to venture an opinion.

I really liked the contents of the paper. It was like a novel I read once. The only criticism that I could make is the same one I made on the novel just mentioned. This writer wrote a novel one time—and it was very early in his literary career. He asked me if I would be fool enough to read the novel, and I said, "Of course

I would be. I will read anything if somebody asks me to." So I procured a copy of that novel, finished it, and was delighted with it. The author said to me, "What do you think of it?" I said, "There was only one criticism and that was that it was not long enough." "Yes," he said, "That is the best criticism that a man could give of the novel." As I said before, the only criticism I have of the paper is that it was not quite long enough, and the essayist deserves considerable commendation for even getting in so much as he has in so short a time.

Dr. E. A. Royce:

In regard to the paper, if I were going to say anything I would take what each one said and discuss it. Regarding the changed curriculum, the educators will attend to that as occasion demands. They will meet the emergencies. The time is here and they will meet it. The work of the dental profession, according to my estimation, is getting the men of the present or the past up to the required standard. That is the question before the profession. How shall it be done? How can it be done best and how quickly can it be done? It must be done.

Sydney J. Knowles:

Mr. President and Members of the Society: We cannot help but recognize that one of the greatest factors in the causation of disease emanates from the mouth. Every day we are convinced of that more and more from the things we find in X-ray work, and in going into the cases and finding, after proper treatment, that our patients are relieved of conditions which heretofore we thought had no connection with dental lesions. I cannot help feeling that science in the practice of dentistry is a greater factor than we formerly thought it was.

Of course the reference to the X-ray is always interesting to every one. I think it is a little aside from the paper, but still it is progress and is the sort of work that the man who is scientific is working to improve.

As to chemistry, bacteriology and physiology, all these subjects are difficult, for the men who have practiced for years, to get into, but are the things men need in the modern practice of dentistry. Dentistry is getting away more each day from the mechanical basis, which is looked upon by some men of secondary importance. I think the practice of dentistry is what we make it ourselves. In other words, there is a chance for us to raise the standard of dentistry, as Dr. Royce has said. The thing is to get the men who are older in practice to develop and keep up with the times.

I want to take the opportunity of expressing my keen appreciation of this splendid paper.

Dr. Hinkins:

I omitted to say that the night before we went to the newspaper to give the notice to the drafted men that there were five of us who were to select ten men each and have them at the college to care for the soldiers on Wednesday night. Every one of them turned out. The first day that the college opened we had about sixty-five men ready to extract and fill teeth on Wednesday night. It was a great comfort to the dental profession that on twenty-four or twelve hours' notice there were that number of men present. Every one I called up said he would come, and so it was with the other four men. Five of us called for fifty men, and we had sixty-five, which gives you some idea of the stimulation of the dental profession.

Dr. Truman W. Brophy:

I do not feel disposed to attempt to say anything light this evening on this subject, but to try to say something that will be serious, which will have to do with the very serious problems that face the dental profession now, with its new and greater responsibility. We have all of us worked hard through the years to bring the dental profession up to the standard of efficiency and the standard that would bring it prominently before the medical profession so it might be recognized and placed where it undoubtedly belongs. I feel that the day has come and it is one of the most important periods in the history of our profession. It is a period that men who were the pathfinders, the men who struggled against the hardest and greatest of odds, men who loved the profession and recognized its worth, appreciated its efforts, felt should come, but they looked forward, for the day was far off, when such recognition should be ours. Men such as Gorgas, Taft, and George Watt, who talked about chemistry—Dr. Hinkins has no doubt slept with the writings of Dr. Watt—Buckingham, Barker, W. H. Morgan, Allport, Cushing and Dean, had a conception of the importance of this profession and something of an idea when it would ultimately reach its goal, but they expected that the time would be far distant. We have one strong man in the rank and file of the medical profession, who stands out prominently among officials of this country. That man is Gorgas, the surgeon-general of the army. Gorgas has been the friend of dentistry from the start. He told me that there was no reason why it should not receive the same recognition that was accorded to medicine. He said he thought it would be done, but when his efforts failed, he was greatly disappointed. Then he tried again. The doctors who were on his staff felt with him and worked with him to this end and without the help of Gorgas and his staff in Washington this would never have been done. Had he taken the other view, it would never have passed Congress.

Now since we are placed in this exalted position how are we going to fulfill the mission? What are we going to do with the men in the profession today, and those who enter the profession; how are we going to impress them with the seriousness of the work to bring the standard of education up to the place where it belongs? How are we going to impress on the young man who enters dentistry the importance of scientific knowledge? Are we not going to enter upon a campaign of education and bring them to a realization of their duties and to impress upon the young men who come to us for advice what they are going to do in college and what they shall do when they get out? Are we not going to impress on the older men the importance of reaching the young men and to impress upon them that they must go to college and they must learn the scientific branches. That has never been done. The student who enters college today has no other interest than acquiring a knowledge of something that will enable him to make a living. The scientific part he does not dream of. He does not see why anatomy, chemistry, physiology, bacteriology, or pathology are necessary. But he should become acquainted with all the elements that enter into human life. He should know his physiology and his pathology and this knowledge is only acquired by careful work in the laboratories, but this does not appeal to him. The dental profession is not aware of the importance of these things or of acquiring a knowledge of them. How are we going to lead them into such paths? I can see a difference in the students of today from those of the past. They are better educated, but they have not the proper conception of the duties of a professional man. It is the commercial side of it that they take into consideration—how much can I make, instead of how much can we do in the interest of suffering humanity, or how can we best equip ourselves to serve those who are needing service; how can we prevent these people from getting into a long period of suffering by reason of neglect? Those are the things. It is a question of efficiency and the word efficiency covers a whole lot. When I look upon this great army of young men who are going to serve their country, I look upon them with some degree of solicitude. What is to be the outcome of it all? Are these men to return to us with a higher degree of efficiency in the practical work of the profession? Are they going out to improve themselves and attain a higher degree of skill than they have at the present time? Dr. Knowles put it right when he said he is a better qualified man today to care for a patient than he was the year he graduated. We all know that. I feel I can do more work today and better work than I could ten years ago. This may be a little personal and I do not know that I care to have it published. After a service of five years in the National Guard of this city, in the capacity of an officer in the medical corps, I retired. I entered upon it on the solicitation of my friend, Dr. Nicholas Senn. This he told me on his return from the Cuban war. Then we had no dentists in the army. Then we had no dentists in the navy. He came back and said, "Dr. Brophy, I want you to do something for me. I want you to get to work and work with all your might to get dentists in the army and in the navy. Do all you can, and I will help you"—and he did. Then I told him that the next year we would have a meeting of the International Dental Federation. That meeting was held in 1901, in England, and we called upon the governments of the nations represented there—some seventeen nations—to make appointments of dentists in the armies and navies of their respective countries. A letter was sent out by the secretary to all the different secretaries of state of the different nations. This was an international meeting, though not large in numbers—there were less than two hundred there. The letter received courteous treatment and replies came back to the secretary from the secretaries of the various countries stating that the matter would be taken up. Spain was the first nation to secure the appointment of dentists in the army and navy, and then England. And so it went through and when we started the movement in Washington to get the dentists appointed, we had the support of Nicholas Senn, and the appointments were finally made in the army and in the navy and here we are today with the dentists in this country in a position that we never dreamed of at that time.

There is a question whether these boys will come back any better fitted to practice their profession, whether they will not get the habit of being a little reckless in their work. I say I am better qualified today to work. I made application and offered my services to go to France some months ago, but the age limit forbids and I have been unable to go. I have even been unable to get my passports to go as a private individual to work as I do here at home, helping to take care of the young men. I still trust I will receive my passports. I received only within the last few days a letter from Professor Charles Godon of Paris, who is the mayor of his section of the city, urging me to come. I think perhaps he was in a measure urged by Mrs. Brophy, who is now in Paris taking care of orphans. She landed there two weeks ago last Sunday. I expected to go with her, but I am here. I do not know that that has anything to do with Dr. Davis' paper, but it shows that I have shown a disposition to do something.

One other thing—I want to say a word about the service of these young men. If there is anything needed right now more than anything else, aside from improving the curriculum of the college, which we are all trying to do now, it is pathological laboratory work. I have always had faith in colleges and college teachers, notwithstanding all that is said about them and their mercenary motives, etc. These things are only said by men who have little idea of what college teachers have to contend with. I believe they have done more to elevate the standards of the dental profession in America than all the other factors combined. While I have been disappointed in the educational standards of the high school graduates, I believe the colleges everywhere are bending their efforts to more thoroughly equip their students to practice than they ever did before. Everybody knows that the college men have tried for years and years to improve conditions and they are going to continue to do so. We have now, in the city of Chicago, the greatest number of students we ever had. They are all seeking entrance into this profession, and we need them. The army people are not having enough dentists to supply their wants. We will find in the next few years, if this war lasts four or five years, there will be a vast number of soldiers to take care of and I believe the students will fill the colleges full for years to come to prepare themselves to care for the wants of the people.

Gentlemen, we are all doing all we can. I believe we are doing the best work and have laid out a better course of study in the Chicago College of Dental Surgery than we ever had before. In my own department there is the keenest interest. I have in years past been unable to raise the enthusiasm in my work and to make my students even feel it, but now they are all on edge to learn. The surgical clinic is packed and the students are making observations of the work that is done. It is the opportunity to study pathology from the practical point of view and I am thinking of organizing in my department another clinic in the college for minor cases, which will be conducted each week for the purpose of making the students acquainted with the minor surgical operations about the face of patients who can come for minor operations, and can go home. Of course those patients which we have to put to bed after, we must keep in the hospital. It seems that each of the teachers this year, perhaps more than ever in the past, has shown a disposition to do something more and are a little more encouraged and enthusiastic in the work than ever before. It occurred to me that we ought to have Dr. Hinkins come out and give some lessons on diet and on some of the other phases of his chemistry work and have the other gentlemen come up to the college and give up a little time to give the students the benefit of their practical experience. It is a matter of immense satisfaction to classes to have some one come in and give them something outside of the regular routine of college work. As dean of this college I invite you to come. I know you are interested to do all you can for the cause.

Dr. J. H. Woolley:

It seems to me that Dr. Davis may have had an inspiration that suggested that paper. I think the discussion tonight has taken a broader range than can usually be found in dental literature. I think the discussions that have gone on tonight, when printed, will make some impression. The idea of the paper all through is very satisfactory and very thoughtful. The latter part of it, as regards the hospital, I think is quite necessary, and called to mind the work that has been done in Paris in regard to the restoration of conditions in the different wounds of the jaws, and those men are able to make the restoration. It will not be possible when the dentists are called to the army that they will simply be treating teeth and extracting teeth, but they will have to do this other work, and they ought to have men of experience, who will be able to take hold of those surgical operations and bring about conditions that will be more serviceable to the patient.

Dr. Brophy:

I ought to have said just a word about what Dr. Davis said in the supplement to his paper. Does Dr. Davis mean by that that it should be the function of this society to undertake to have a hospital here similar to the Forsyth or the Eastman?

Yes, that is the idea. I thought a good deal about it and have done a little something about it, but there has nothing been definitely done about it yet. I tell you what I will do. With your president's permission I will make a motion that a committee of three be appointed to take this matter under consideration and see if some plan may not be developed, even if we have to call a special meeting in order to get something done. I think that is the motion.

Dr. Davis (in answer to Dr. Brophy's question):

My thought is this, that this organization has brought forth a good many things that have been for the benefit of the profession and humanity and now is the time to strike, while the iron is hot. I do not think it can come with better grace from any other organization than this, to start the movement that will result in a dental hospital in this city and a dental hospital in every large city in the United States. I think it is a necessity. It is one of the things that has come to the front and it is one of the things that I intend to emphasize. When Dr. Brophy said everyhing has been said, I knew this subject was dear to his heart and thought he would probably give us some of his views.

Dr. Brophy:

This society before has done some things. When we started the movement here to establish dental service in the public schools and went ahead on one school and started it, we made this the nucleus of the whole work, which led to the organization of other schools up to the present time.

In regard to this other matter, I do not see any reason why we cannot have an institution like this, turning the waste of the Red Cross proceeds into a hospital to care for the wounded. We will have our wounded soldiers back here in the next six or eight months, who will need the kind of care the medical man cannot give, because he is not instructed in the prosthetics and surgery of the mouth. If we can have such a place here, we should do so now. While we may have to get a temporary place to provide for the wounded, we shall have a place where they can be well cared for. A temporary place may be secured, but in the future we should have a place where they can be sent. Otherwise, what is going to take care of the 80 per cent afterwards unless some provision is made.

Dr. Davis (closing):

Mr. President and Members of the Odontological Society: I wish to thank you for your compliments on this paper. It was not a great effort for me to think of the few words that I have committed to paper. The only thing was that I did not have time sufficient to go into a little more detail regarding some of these ideas. They have been for some time sailing around within my brain and more especially the one which I last mentioned and which did not appear in the paper. I think the time is now ripe for us to at least appoint a committee and gain some little publicity on this subject, to show the citizens of Chicago how necessary such an institution as this is. With the aid of the larger societies I see no reason why this matter should not shoot through this community just like the fire did forty-six years ago tonight through this city of Chicago. I see no reason—the thing is in the air. We are stimulated on every side by this war question. I think every man is beginning to realize the duties that are before him. I am endeavoring to call attention, not to the little bunch who read this paper, but to the profession all over the country, of the necessity for a greater amount of study, for the review of the work that should have been done through their student life and which they did not completely get through. I think if every man will only take up his old text-books and read them again, he will be a better dentist for having read them, though he will never have to use them.

THE DENTAL REVIEW

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year, including postage, to all parts of the United States, its possessions, and Cuba. Canada $1.40. All other countries $1.75 a year.

EDITORIAL.

THE DUTY OF THE PRESENT-DAY DENTAL STUDENT.

In view of the recent legislation at Washington whereby all dental students were placed on the Reserved list, and permitted to continue their college studies, there is an obligation placed upon each student to so devote his energies to his work that there can be no question as to his fitness to practice dentistry when his college course is completed. In fact there is an understanding between the Federal authorities and the college teachers that if any student fails to do satisfactory work in college, and misses in his examinations for advanced standing he may at once be denied the privilege of further attendance at college and will automatically lose his status as a student and be compelled to go into a military training camp as a regular soldier of the line. This seems a perfectly fair provision. The Government and the college have done their full duty in the matter when they have given the student the opportunity of avoiding ordinary military service by preparing himself for this special kind of work. It was not intended by the Government that the student should be permitted to shirk responsibility in any way, but that he should be allowed to engage in that particular kind of effort in which he might be the most useful. If he does not see fit to properly prepare himself for the special service represented by the practice of dentistry then it is only logical for the Government to put him at something else. This is a time when the service of every one is needed, and if an individual will not serve acceptably in one capacity he must be compelled to serve in another.

But the dental student should not permit this to be a matter of compulsion at all. Accepting in a wholehearted and grateful way what the Government has done for him he should exert himself in every conceivable manner to show his appreciation by the most painstaking application to his studies with the idea uppermost in his mind that he is working not merely for the sake of a diploma at the end of his college course but that he is so preparing himself in the science and art of dentistry that whenever the Government may need him he will be found fully equipped to render a good account of himself.

There is not the slightest question that during the present college session the teachers in our dental schools will exact a higher degree of efficiency from students than ever before. It could not be expected that they would do otherwise. They would not fulfil their obligation to the Government if they fail to do this. The Government has placed dentistry in a higher rank of the world service, and our future graduates must measure up to this rank. No student should be turned out of college next spring without a higher conception of his professional status and professional obligation than has been possessed by any previous class of students in the history of dental education. If a student cannot be trained to this high conception then he has no place in the profession today.

Part of the teaching in our colleges during this session should consist in drilling into the minds of the students the high sense of responsibility which they assume as they proceed to graduation, and by the same token the surest way to drill students in the fundamentals of an exalted professional conception is for the teachers themselves to so conduct their professional lives that an example of probity and correct living is ever before the student body. A sense of seriousness and consecration to duty should permeate every dental college in the land, and this year in which such signal distinction has come to the profession should mark a long step in advance in the preparation of our students to practice.

STILL AT IT.

Despite all that has been written and said with regard to the injustice of X-ray men writing a diagnosis for patients this practice is still being kept up by some radiographers. It is the same old routine. The patient goes to a physician for some ailment, the physician inspects the teeth and sends the patient to an X-ray man. The X-ray man feels in duty bound to "find something." Knowing that the physician does not claim to interpret X-rays he proceeds to interpret them for him, and writes his report. This, to be impressive, is handed to the patient either by the radiographer or the physician. Usually it is liberally sprinkled with such terms as "Abscess," "rarefied area," "infection," "pyorrhea," etc. And when all else fails, the ubiquitous radiographer writes "alveolar absorption." He must write *something.* It is his stock in trade to do so. A very brave—and honest—radiographer is the one who has the courage to write occasionally, "I find nothing abnormal."

Recently a most glaring and flagrant case of imposition came to the attention of the writer. A lady was sent by her physician to a radiographer who made an X-ray examination of her teeth. The report went back to the physician indicating at least four abscesses, and the remaining teeth were all marked "alveolar absorption." As a matter of plain fact there was just one shadow at one root end, and there was positively no abnormal alveolar absorption at all. In fact considering the age of the patient the alveolar process was remarkably well preserved—more than usually so. And this report was turned over to the patient. The injustice of such a procedure is too apparent to be discussed. The radiographer, although not a dentist, *knew* that this mouth was in no such condition as he had portrayed. If this sort of thing continues the name of the X-ray man will be heralded from the house-tops as synonymous with fraud and faking. The splendid service of the conscientious radiographer will be discounted and discredited and the whole art will be looked upon with suspicion.

Sufficient error will creep into the interpretation of X-ray pictures in the hands of the most capable and honest radiographer, and all charity should be extended for mistakes of this kind, but to play upon the ignorance of the public by wilfully misrepresenting what the picture shows is beneath the pale of ordinary honesty or common decency. In fact it borders closely on the criminal.

THE EDITOR'S DESK.

UNSATISFIED.

We but grasp at the things which we most wish to hold,
Our finger tips touch and let slip;
We reach for the fruit as did Eve of old,
We taste, but it's only a sip.

We catch glimpses of beauties which charm and delight,
The vision is fleeting and gone;
We march with a myriad comrades in sight,
We turn, and are marching alone.

We plan for the future with diligent care,
The future smirks back in our face;
We rush to the goal till our feet are run bare,
But we end with a faltering pace.

We greet an old friend with a joy in our heart,
And a stored up message to tell;
But scarce do we meet till we signal and part;
It is always a hail and farewell.

The good we would do is never quite done,
The wrong is seldom made right;
We start with the hope of the bright morning sun,
And we end with the shadows of night.

We get glimpses, and snatches, and fragments and parts;
We never encompass the whole;
Our lives are a series of promising starts,
But we seldom land quite on the goal.

It is struggle and strive, fall down and get up.
The path is never quite straight.
Yet mayhap the failure at draining the cup
May be but the kindness of fate.

BOOK-REVIEWS.

LECTURE NOTES ON CHEMISTRY FOR DENTAL STUDENTS. By *H. Carlton Smith, Ph. G.*, Lecturer on Physiological and Dental Chemistry at Harvard University Dental School. Third edition, revised and enlarged. 455 pages. Published by John Wiley & Sons, Inc., New York, 1917.

The author of this book is modest when he calls it "lecture notes for students." It is much more than this. It is a somewhat elaborate and painstaking system of instruction to students not only in the science of chemistry, but in the best methods of studying chemistry. This subject has always been a difficult one for most students to acquire, and every plan which simplifies it and makes it easier of comprehension, should be welcomed. This book has many useful suggestions along this line, and we also believe that the author has the true conception as to the real value of chemistry to dentists. He makes the significant statement at the beginning of the volume: "As the student of dentistry takes up the study of chemistry, it is necessary that he should realize that the course will be of value to him in the ability acquired to draw correct inferences from observed phenomena, and in the attainment of accuracy and delicacy of manipulation, fully as much as in amount of chemical knowledge obtained." This ability "to draw correct inferences from observed phenomena" is the *sine qua non* of success in the study and practice of dentistry more probably than any other one thing, and for this reason, if for no other, the student should be drilled in chemistry till he has learned how to observe phenomena and reason from cause to effect. As a means to this end the present volume will be found most valuable.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Belt Slip:—Apply to it a wad of cotton saturated with sandarach varnish.—*J. H. Kolter, Wausau, Wis.*

To Prevent Distortion of Wax Bites for Bridges:—Run up bite in plaster or artificial stone. Allow it to harden thoroughly before attempting to adjust to cast.—*Victor H. Fuqua, Chicago, Ill.*

Straight Chisel for Enamel:—Can be made from an old cement spatula by cutting off the blade up near the shank. Temper and sharpen remainder of blade.—*E. J. Neushwander, Morris, Ill.*

Cleaning Rubber Files:—Pour chloroform over the file, which causes the imbedded rubber to curl up and loosen. Then take any kind of a stiff brush and remove the rubber, leaving a file that is as good as new.—*L. N. Roubert, Chicago, Ill.*

Look to the Roots as Well as the Crowns:—Many teeth are being crowned or filled, which if X-rayed before such operations were decided upon, would be handled in a manner eminently more satisfactory to the patient.—*Elmer S. Best, Minneapolis, Minn.*

Plaster Models:—Many good models are spoiled by placing the wet bite back on the model. Dry the wax with a doily or compressed air, each time you take it from the mouth wet with saliva, and you will not spoil the surface of your plaster models, and your plaster will fit better.—*Homer Almon.*

Matrix for Synthetic Fillings in Adjoining Proximal Cavities:—Place a piece of soft temporary stopping between a folded celluloid strip. Put strip between teeth with stopping on the lingual surface and draw both ends forward, moulding the soft stopping to the lingual surface. Insert fillings, then hold back both ends.—*F. G. Levenhagen, Wausau, Wis.*

Backing Goslee Teeth:—Goslee teeth backed up with 1/1000 platinum as a main saddle, then a 14-gauge round clasp metal pin soldered to a little scrap piece of platinum, a millimeter or so in size, then swedged or burnished and resoldered to the main saddle, will not burn when soldering or casting and is cheaper than 38-gauge pure gold.—*Y. E. Whitmore, Little Rock, Ark.*

To Increase Efficiency of Local Anesthetic Solutions:—The addition of adrenalin chlorid (20 drops of the 1-1000 Sol. to the ounce of local anesthetic solution) does three things: 1. Renders the operative field comparatively bloodless. 2. Greatly intensifies and prolongs the anesthetic effect. 3. Renders the solution much less toxic by retarding its absorption into the systemic circulation.—*P. G. Puterbaugh, Chicago.*

Be Thorough:—Many times a dentist will glance into a mouth, and in a few minutes lay out a plan for its complete repair. This is wrong, because in dentistry a hastily made plan often proves erroneous and costly for patient and dentist. The proper way is to make a careful and thorough examination, study models and X-ray pictures, and then through careful deliberation, reach a conclusion. In dentistry, at present, there is too much execution and not enough thought. Perhaps if we used more thought we would have less executing to do.—*O. de F. Davis, Minneapolis, Minn.*

Salesmanship in Dentistry:—Study your patient. Study the mouth conditions thoroughly, make a plan of how it can best be restored. Then don't try to sell the plan or the restoration of the mouth or, in fact, anything at all. You have nothing for sale, but get the patient's absolute confidence in your ability to take care of the case competently. Or in other words have them, or get them in a frame of mind so they will utter words, as for example, "Doctor, I am in your hands, take care of my mouth as you would have your own taken care of." This, in a nutshell, is "Salesmanship in Dentistry."—*W. O. Fellman, Oak Park, Ill.*

Solving the X-ray Problem:—I arrange with an X-ray laboratory to take pictures for my patients as I need them—the bill to be sent to me at stated intervals. When an estimate is made for a series of operations the X-ray service is included. I may then have as many pictures taken as I see fit without protest from the patient, and without the feeling that I am urging radiographs from mercenary motives. The pictures are sent direct to me and not seen by the patient till I have examined them. In this way I avoid discussion, and my services are valued by the patient.—*R. W. Lee, Chicago, Ill.*

MEMORANDA.

CHICAGO DENTAL SOCIETY.

The annual clinic of the Chicago Dental Society will be held in the La Salle Hotel, Chicago, Ill., January 26, 1918. The program promises to be one of special interest to the profession. Remember the date, January 26, 1918. P. B. D. Idler, president; T. A. Broadbent, secretary.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

This board will hold its next examination at Sioux Falls, S. Dak., beginning January 7. 1918. All applications must be in the hands of the Secretary by January 1. Fee, $25.00. Address Robert Jasman, Secretary, Scotland, South Dakota.

MINNESOTA STATE DENTAL ASSOCIATION.

The thirty-fifth annual convention of the Minnesota State Dental Association will be held February 7, 8, 9, 1918, at the University of Minnesota, Minneapolis, Minn. All members of the National Dental Association are invited to attend this meeting. For information address Max E. Ernst, Secretary, 1125 Lowry Bldg., St. Paul, Minn.

NORTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the State Board of Dental Examiners will be held in Fargo, N. D., beginning Tuesday morning, January 8, 1918. All applications and credentials to be in the hands of the Secretary ten days prior to the date of examination. For application blanks and further information, write the Secretary, Dr. W. E. Hocking, Devils Lake, N. D.

DEATH OF DR. W. A. WHITE.

Dr. W. A. White of Phelps, N. Y., died at his home October 14, 1917. He had been a force for good in his state for years, and was well known throughout the country. Several years ago he lectured on oral hygiene extensively over a large territory, and was recognized as one of the leading spirits in spreading abroad the value of hygiene of the mouth. He had been in failing health for some time, but was confined to the house only about ten days before his death.

NOTICE OF THE ANNUAL MEETING OF THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

The annual meeting of the Dental Protective Association of the United States will be held at the Palmer House, State and Monroe streets, Chicago, on the third Monday of December, the 17th, at 4 p. m. sharp. The report of the officers, including the status of the litigation with the Carr patents, will be given; a board of directors will be elected, and such other business transactions as should come before the association.

Heretofore each member has received a postal card notice of the annual meeting. This will not be done hereafter for the reason that it was voted by the members at the meeting last year to discontinue the individual notice, substituting therefor the publication of a general notice in the Journal of the National Dental Association, and all other important journals.

All members are urgently requested to be present.

By order of the Board of Directors,

J. G. Reid, *Pres.,*
J. P. Buckley, *V.-P. and Sec.,*
D. M. Gallie, *Treas.*

FREE DENTAL CLINICS FOR ST. LOUIS SCHOOLS.

At a meeting of the Board of Education, held on September 11, 1917, the Superintendent of Instruction submitted a proposition for the establishment of a dental clinic, and his recommendation covering the establishment of said clinic and the management thereof is as follows, and was unanimously adopted by the board:

Through the interest of Dr. H. F. D'Oench a proposition for the establishment of a free dental clinic for the indigent children of the city has been presented for consideration by the Board of Education. The St. Louis Dental Society, provided with a fund of $2,500 annually, donated by a private philanthropist, proposed "to equip at least two units, consisting of chairs, cabinets, instruments, etc.; to pay one dentist, to be appointed under the auspices of the St. Louis Dental Society, said operator to serve full time, i. e., from 9:00 a. m. to 4:30 p. m., during the school term of ten months. As assistants to the above, selected senior students, recommended by the deans of our two dental colleges, will serve without pay."

The Society asks co-operation by the Board of Education in the following ways:

First. That the Board sanction the establishment of such a clinic in a location to be determined by the Superintendent of Instruction.

Second. That the Board furnish adequate space with light, heat, electricity, gas, water, soap, towels, stationery, janitor and a nurse to care for the children, act as an assistant, keep records, etc.

Third. That the St. Louis Dental Society be granted the privilege of delivering talks in the assembly room of the various schools in the city on mouth hygiene, care of the teeth, etc., these lectures to be under regulations determined by the Superintendent of Instruction.

The urgent need of such a dental clinic makes it highly important that the Board of Education should avail itself of this generous offer. It is therefore recommended that the Board approve the establishment of a clinic under the general conditions set forth above; that a sufficient number of rooms at the Central High School be set aside for the clinic; that all necessary alterations and repairs, including such items as plumbing, be made at the expense of the Board; that the Board assume the expense of such matters as salary of nurse, maintenance of rooms, and such supplies as are noted above; and that the privilege of giving instruction in mouth hygiene and care of the teeth, under regulations determined by the Superintendent of Instruction, be extended to the St. Louis Dental Society.

The total cost of plumbing and all other expenses incident to putting the rooms at Central High School in shape for use as a clinic will be approximately $500, and it is recommended that the Commissioner of School Buildings be authorized to solicit bids for this work, and to request an adequate appropriation from the general fund to pay for same. The expense for supplies to be furnished by the Board and the salary of the nurse will approximate $1,000 annually. It now appears that the appropriation for "Salaries" and for "Expense" in the Department of Hygiene will be adequate to care for the cost of salary of the nurse and of all necessary supplies for the year. It is recommended, however, that the auditor's books show the total cost of the Dental Clinic as paid out of these several appropriations.